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WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE FISH AND WILDLIFE SERVICE,
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CONTENTS

	Page		Page
Abstracts:		Abstracts--Continued	
Classification	2	Management	26
Conservation	2	Natural history	43
Control	3	Predation	45
Cycles	5	Propagation	46
Destruction	6	Research	46
Diseases and parasites	6	Weights	48
Ecology	12	Wildlife leaflets	48
Education	17	Notes and news	49
Food habits	18	Author index for this issue	50
Life histories	23		

Chicago, Ill. No. 45 February, 1946

WILSON ORNITHOLOGICAL CLUB

Classification: Bears

Anderson, Rudolph M. Summary of Canadian black bears with description of two new northwestern species, Rapport Annuel Societe Provancher 1944 (85 des Franciscains, Quebec, Canada), 1945, pp. 17-33; French version pp. 34-52.

Euarctos randi and E. hunteri are described as new from northwestern Canada; the characters and ranges of these forms, E. vancouveri, E. carlottae, and of 5 subspecies of E. americanus are set forth.

Conservation

Murphy, Robert Cushman. Conservation for everybody, School Nature League Bul. (National Audubon Society, 1006 Fifth Ave., New York 28, N. Y. 10 cents a copy), 12(7), March 1945 (reprinted Nov. 1945), 4 pp., 7 figs.

Original natural wealth of North America; background of the settlers in relation to their policies of exploitation; previous lack of conservation education and present need for intensification of it; the philosophy must be inclusive and integrated. "For untold millions of years, nature contrived to get along gloriously on this great North American continent without the dominating interference of man. It should be our ideal to restore as much of the primitive system as we find consistent with our own safety and with the new uses of land and sea required by a populous civilization. The task of bringing back such well-ordered wealth and abundance to the face of the earth is not to be conceived as a hardship, because the conservation of all natural resources and the encouragement of a varied native wild life surely promote the best possible world for man himself." A list of recommended reading is appended.

Conservation: Bighorn

Carson, Burch, Jr. A fight for survival, Texas Game and Fish (Walton Bldg., Austin, Texas. 10 cents a copy), 4(1), Dec. 1945, pp. 20-21.

Status of bighorns in Texas, where in the past four years their already small numbers have decreased by half. Location of the survivors is given. Competition and diseases of domestic sheep are the limiting factors. The animals should have a fenced range for their exclusive occupancy.

Conservation: Bird

Linsdale, Jean M., Paul L. Errington, and J. A. Munro. Report of the A. O. U. Committee on Bird Protection for 1944, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 62(4), Oct. 1945, pp. 613-619.

A modern, ecological discussion, giving representation to a variety of viewpoints. The impact of wildlife management, sport, commercialism, land policies, and conservation efforts upon birds is discussed. Current information on the status of threatened species is in constant need. It is suggested that the Union define its interest in bird protection and avoid duplication of the work of other organizations.

Conservation: General

Zon, Raphael, et al. Conservation of renewable natural resources. University of Pennsylvania Press (Philadelphia. $2.50 a copy), vi+200 pp., 1941.

Although containing little on wildlife (mostly quoted below), this is a good work on general conservation, It contains chapters on vegetation as indicators of appropriate soil use and conservation practices, climatic cycles and changing environment, and administration of natural resources.

"Wildlife and water fall in a somewhat different category from trees, forage, and soil both because of their nature and because of the greater control already exercised over them by the state. As state property, the taking of wildlife is completely controlled by the state authorities in spite of the fact that it occurs for the most part on private lands. The outstanding problem in its management is to induce private owners to adopt such measures as will increase the supply and make this supply available to the hunting public. This means that due consideration should be given to wildlife as an important resource in all plans for forest and farm management, and that the owner should receive an adequate return for any expenditures made for its production, either by the hunter or fisherman or by the state itself acting in behalf of the general public. State ownership of lands used primarily for wildlife refuges and public hunting grounds, and the production of wildlife in state forests, constitute an important part of the broad program of state ownership of wild lands." (Samuel T. Dana, p. 171.)

Control: Enemies of birds

Headstrom, Richard. Outwitting bird enemies, Bul. Mass. Audubon Society (155 Newbury St., Boston 16, Mass. 20 cents a copy), 29(8), Nov. 1945, pp. 246-249, 7 figs.

Illustrated suggestions for repelling enemies from bird houses and feeding stations.

Control: Foxes

Garlough, F. E. Capturing foxes. U. S. Dept. of the Interior, Fish and Wildlife Service Circ. 8 (Supt. of Documents, Washington 25, D. C. 5 cents a copy), 11 pp., 5 figs. + cover cut, 1945.

The groups of foxes occurring in the United States are defined and their distribution is mapped. Brief notes are presented on the breeding and feeding habits of the animals, rabies among foxes, and fur qualities. Reasons for fox control are set forth and directions are given for trapping and den hunting. Bibliography of 11 titles.

Control: Rodent damage to fir seedlings

Krauch, Hermann. Influence of rodents on natural regeneration of Douglasfir in the Southwest, Journ. Forestry (825 Mills Bldg., Washington 6, D. C. 50 cents a copy), 43(8), Aug. 1945, pp. 585-589, 5 tables.

Regardless of other unfavorable conditions, restocking was better on plots where rodents had been poisoned. In the Southwest, such control is necessary to reproduction of the Douglas fir and it also favors the establishment of white fir seedlings. Cutover areas should be poisoned in years when good seed crops occur. Large areas should be treated to reduce the effects of reinvasion from unpoisoned tracts. Subsequent treatment is unnecessary as apparently seedlings a year old are no longer subject to rodent damage. In remaining uncut stands, rodents may be controlled sufficiently by silvicultural measures. As most of the stands are of value for watershed protection and recreation, only light cutting should be done.

Control: Rodenticides

Ward, Justus C. Rodenticides--present and future, Soap and Sanitary Chemicals (254 West 31st St., New York, N. Y.), 21(9), Sept. 1945, pp. 117, 119, 127.

Effects of the war upon the availability of standard poisons; countermeasures taken in the fortification of red squill and the development of new poisons, two of which (Antu and 1080) are commented upon in some detail. For the present these should be used with the utmost caution.

Control: Snake, Bull

Imler, Ralph H. Bullsnakes and their control on a Nebraska wildlife refuge, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 265-273, 6 tables, 2 pls.

On the Crescent Lake Refuge, bullsnakes in 1938 robbed 42 percent of 274 duck nests under observation. Of control methods tried, only trapping proved effective. Live traps connected by drift fences were employed. Numerous other animals were trapped but assumably could be released unhurt. Trapping for four years was accompanied by a great decrease in nest destruction by the snakes. Much information on the life history of the bullsnake is recorded under the headings of: sex ratio, eggs and young, growth rate, sun tolerance, and food habits. "Mammals comprised slightly more than half of the food, and bird eggs and nestlings supplied the remainder."

Control: Snakes

Gloyd, H. K. The problem of too many snakes, Chicago Naturalist (Chicago Academy of Sciences, Lincoln Park, Chicago 14, Ill.), 7(4), Dec. 1944, pp. 87-97, 5 figs.

Although most snakes are preponderantly beneficial in feeding habits, there are local problems of overabundance which call for control. Possible ways of reducing the number of snakes are discussed, removal of cover and exclusion by fencing being most approved. Elimination of dens or of snakes in them, with examples, are described. Natural enemies of snakes are briefly mentioned, as are also fluctuations in serpent populations and the study of these animals.

Control: Water hyacinth

Gowanloch, James Nelson. Economic importance of the water hyacinth, Eichhornia crassipes, in management of water areas, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 339-345.

Origin, introduction, and spread of the plant; damage done by it; and history and development of control. Author's summary: "(1) The water hyacinth (Eichhornia crassipes) is the number one aquatic plant problem in management of water areas in the Deep South; (2) the species has now become established across the southern part of the United States as far north as Savannah, Georgia, and Los Angeles, California; (3) there appears to be a definite development of increased tolerance by this species for lower temperatures and for higher salinities during the past 14 years in Louisiana; (4) water hyacinth is capable of dominating and ultimately eliminating all native floating and submerged aquatics, including the aggressive American lotus (Nelumbo pentapetala Walt. (N. lutea [Willd.] Pers.)); (5) establishment of the species in stationary beds excludes light and completely destroys any useful biological pattern of plant or animal life in the waters beneath it; (6) invasion by water hyacinth correspondingly abolishes completely any waterfowl values of the area; (7) mechanical action of even small wind-driven rafts of water hyacinth serves to tear out and destroy natural or artificial plantings of valuable aquatics used by waterfowl; (8) growth in initial stages interferes with the use of sport fishing gear and, if uncontrolled, renders the invaded areas impenetrable for navigation; (9) possibilities of control investigated included the categories of: (a) Biological control by introduction of parasites. Reveals, so far, poor promise of success; (b) control by use of flame throwers. Completely unsuccessful, and even if successful impractical economically; (c) chemical control. Impractical because the only economically effective agents tested involved unacceptable poisoning hazards; (d) mechanical control. The only effective, practical method in the opinion of the writer. Though expensive, this cost is justified by the results obtained and the damage thereby prevented. Mechanical control involves the use of highly differentiated equipment for the range of situations encountered in any general water hyacinth control program. Small portable units experimented with proved effective with a potential capacity per unit of clearing 1,200 square yards of water hyacinth an hour." Bibliography of 11 titles.

Cycles

Black, C. T. Enigma of the North, Michigan Conservation (Mich. Dept. of Conservation, Lansing 13), 15(1), Jan. 1946, pp. 3, 11, 1 fig.

A snowy owl invasion is on this winter and by December 15, more than 400 individuals had been reported in Michigan. A general survey of the influx is in progress. Comment on cycles and on predator-prey relationships among the cyclic species.

Cycles: Arctic animals

Chitty, Helen, and Dennis Chitty. Canadian Arctic Wild Life Enquiry, 1942-43, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, N.W. 1, London, Eng. 20 shillings a copy), 14(1), May 1945, pp. 37-45, 4 figs., 2 tables.

Annual report on this enquiry by questionaries, discussing and summarizing fluctuations in lemmings, arctic fox, snowy owl, and disease among sledge dogs.

Destruction: Bighorn by porcupine

Pulling, Albert Van S. Porcupine damage to bighorn sheep, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, p. 329.

Finding of remains of a ewe with porcupine quills embedded in skin of the forehead.

Destruction: Birds by hail

Kimball, J. W. Effects of a hail storm on pheasants and other wildlife, Flicker (University of Minnesota, Minneapolis), 17(3), Oct. 1945, pp. 46-50, 1 map, 2 tables.

Description of the storm which occurred in Faribault, Freeborn, and Mower counties, May 20-21, 1945. Many dead birds were found and a crowing census of pheasants made for which there was available for comparison a similar count made about a month earlier. The findings are tabulated and discussed. Author's conclusions: "(1) The Albert Lea hail storm of May 20, 1945, struck an area of 1,100 square miles with sufficient force to partially or completely destroy all pheasant nests. A large number of adult pheasants were also undoubtedly killed in this area; (2) this storm struck an area of 130 square miles within the 1,100 square miles area with a force which is believed to have killed or injured three-fourths of the adult pheasants in the area; (3) as determined by the crowing count census and supported by field and roadside observations, it is estimated that not less than 5,000 to 10,000 adult pheasants were killed by the Albert Lea hail storm."

Diseases and Parasites: Control of diseases of wildlife

Herman, Carlton M. Deer management problems as related to diseases and parasites of domestic range livestock, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 242-246.

Probably ecological methods can best be applied to the control of disease in wildlife; the author makes suggestions applicable to regulation of food supply, elimination of diseased animals, and disposal of intermediate hosts. His conclusions are: "Very little is known of the diseases of deer or other wildlife. There is a great need for further work in this field. Much

experimental work is needed in the development of tools and methods of investigation and a great deal of research is required to determine practical methods of control. Diseases of wildlife can be attacked through management procedures by prevention or control but therapeutic treatment of individual animals is impractical and usually not feasible. An understanding of the relationships of diseases of livestock and deer by conservation agencies will do much to create cooperation between stockmen and game management agents. Control of these diseases in deer will not only better conditions in the deer population and aid the programs of agriculture but will ultimately better the health of all species concerned."

Diseases and Parasites: Encephalomyelitis

Beaudette, F. R., and C. B. Hudson. Additional outbreaks of equine encephalomyelitis in New Jersey pheasants, Journ. Amer. Vet. Med. Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 107(825), Dec. 1945, pp. 384-386, 1 table.

Review of known occurrence of the disease in New Jersey pheasants and notes on new cases. Total eight, 1938-44. Symptoms, lesions, bibliography of 7 titles.

Diseases and Parasites: Encephalomyelitis

Shahan, M. S., and L. T. Giltner. A review of the epizootiology of equine encephalomyelitis in the United States, Journ. Amer. Vet. Med. Assoc. (600 S. Michigan Ave., Chicago 5, Ill. 75 cents a copy), 107(824), Nov. 1945, pp. 279-288, 2 figs., 1 table.

Review of information about this disease, including records of its occurrence in wild birds and mammals. Bibliography of 71 titles.

Diseases and Parasites: Lead poisoning

Mohler, Levi L. Lead poisoning of geese near Lincoln, Nebraska Bird Review (F. W. Haecker, 506 South 52nd St., Omaha, Nebr. 50 cents a copy), 13(2), July-Dec. 1945, pp. 49-50.

About a hundred geese died from lead poisoning at Salt Lake in March 1945; the shot pellets that killed them apparently were ingested locally.

Diseases and Parasites: Plague

Hampton, Brock C. Plague infection reported in the United States during 1944 and summary of human cases, 1900-44, Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 60(46), Nov. 16, 1945, pp. 1361-1365, 2 tables.

Summary of cases (504 with 318 deaths) in the United States, 1900-1944; report on infections found in rats, wild rodents, and their ectoparasites in 1944 (23 instances in 6 western states).

Diseases and Parasites: Toxoplasmosis

Denton, J. Fred. Apparent death of a blue jay from Toxoplasmosis, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 62(4), Oct. 1945, p. 637.

Lesions of a bird seen to drop dead; blood picture; Toxoplasma undoubtedly the cause of death; Georgia.

Diseases and Parasites: Tularemia

Jellison, W. L., and R. R. Parker. Rodents, rabbits and tularemia in North America: some zoological and epidemiological considerations, Amer. Journ. Tropical Medicine (Williams and Wilkins Co., Baltimore 2, Md. $1.50 a copy), 25(4), July 1945, pp. 349-362, 5 maps.

Authors' summary: "(1) In the epidemiology of tularemia the distinction between rabbits, the order Lagomorpha and rodents, the order Rodentia, should be recognized; (2) about 90 per cent of the human cases of tularemia result from contact with rabbits; (3) as the remaining 10 per cent must include cases contracted from rodents, sheep, game birds, miscellaneous mammals, as well as tick and deerfly bites, it is obvious that less than 10 per cent of the cases are the result of contact with true rodents; (4) the importance of the rock rabbit, Ochotona, the volcano rabbit, Romerolagus, the pigmy rabbit, Brachylagus, the arctic hare, Lepus arcticus, and the domestic rabbit, Oryctolagus, as reservoirs or sources of human infection is negligible or unknown; (5) the snowshoe [hare], Lepus americanus, has been found infected in nature, but its importance as a source of human infection has been overemphasized; (6) the jack rabbits are known reservoirs and the source of a small percentage of human cases of tularemia. Their greatest importance may be indirect as a source of infection for ticks and deerflies which later bite and infect man; (7) in North America the cottontail rabbits, Sylvilagus spp., and in particular S. floridanus, are the direct source of over 70 per cent of all human cases of tularemia. Of the 14,000 total cases reported, less than 40, or 0.3 per cent, occurred beyond the known range of Sylvilagus. Bibliography of 56 titles.

Diseases and Parasites: Typhus

Rumreich, A. S., and Jean A. Koepke. Epidemiological significance of seasonal variations in rodent-ectoparasite distribution, Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 60(48), Nov. 30, 1945, pp. 1421-1428, 2 figs., 5 tables.

Review of previous investigations of the distribution and transmission of typhus fever and report upon field studies in Florida, Alabama, and Hawaii. The relative importance of various rat fleas and mites as vectors is discussed.

Diseases and Parasites: Acanthocephala, Corynosoma

Van Cleave, Harley J. The acanthocephalan genus Corynosoma. I. The species found in water birds of North America, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 31(5), Oct. 1945, pp. 332-340, 2 pls., 1 table.

Summary of information as to hosts, structure, and occurrence of two species, one of which C. anatarium is described as new from Texas; comparative notes, illustrations. Bibliography of 15 titles.

Diseases and Parasites: Acarina of Delaware

MacCreary, Donald. Ticks of Delaware with special reference to Dermacentor variabilis (Say) vector of Rocky Mountain spotted fever, Delaware Agr. Expt. Sta. (Newark), Bul. 252, 22 pp., 2 figs. plus cover cut, 4 tables, Jan. 1945.

Life history of the dog tick, which also occurs on practically all of the wild animals of the State (woodchucks and foxes are heavily infested), seasonal abundance, immature stages (favorite hosts are native mice), and incidence of the fever in Maryland (49, nine fatal, 1933-44). Annotated list of 7 additional species of ticks known from Delaware. Bibliography of 9 titles.

Diseases and Parasites: Aspergillosis

Bellrose, Frank C., Jr., Harold C. Hanson, and P. D. Beamer. Aspergillosis in wood ducks, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 325-326.

Considerable mortality occurred near Havana, Illinois, from aspergillosis apparently contracted through feeding on moldy corn. Review of recent reports (5 titles cited) on this affection among wild birds in the United States.

Diseases and Parasites: Diptera, Cephenemyia

Herman, Carlton M. Cephenemyia jellisoni Townsend (Diptera Cuterebridae) reared from nasal bot of blacktailed deer, Pan-Pacific Entomologist (R. C. Miller, Calif. Acad. Sciences, San Francisco. 75 cents a copy), 21(3), July 1945, p. 120.

This fly has been reared from the host named in California and Montana.

Diseases and Parasites: Diptera, Cephenemyia

Herman, Carlton M. The nose bot fly of deer, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 32(1), Jan. 1946, pp. 17-18, Figs. 4-5.

Habitat of the maggots and symptoms caused; description and photograph of larvae and adult (Cephenemyia).

Diseases and Parasites: Diptera, Lipoptena

Hare, John E. Flying stage of the deer louse fly, Lipoptena depressa (Say), in California, Pan-Pacific Entomologist (R. C. Miller, Calif. Acad. Sciences, San Francisco. 75 cents a copy), 21(2), April 1945, pp. 48-57.

Host and geographic distribution of nearctic species of the genus; seasonal occurrence and life history of L. depressa. Bibliography of 17 titles.

Diseases and Parasites: Nematoda, Crenosoma

Dougherty, Ellsworth C. A review of the genus Crenosoma Molin, 1861 (Nematoda: Trichostrongylidae); its history, taxonomy, adult morphology, and distribution, Proc. Helminthological Society of Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md.), 12(2), July 1945, pp. 44-62, 3 figs., 1 table.

Review of study of this genus, systematic account of the species, including for each: synonymy, distribution, hosts, and comparative notes; key to 9 species (C. goblei from raccoon, California, described as new); measurements, illustrations; taxonomic position of the genus; geographic and host distribution of the species. Two-page bibliography.

Diseases and Parasites: Nematoda, Dispharynx

Goble, Frans C., and H. L. Kutz. The genus Dispharynx (Nematoda: Acuariidae) in galliform and passeriform birds, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 31(5), Oct. 1945, pp. 323-331, 3 tables.

History of knowledge of the genus; records of occurrence in New York birds; incidence much higher in young than in adult ruffed grouse; number of specimens recovered from individual hosts; pathology, morphology; comparative notes; synonymy of D. spiralis with D. nasuta; hosts; geographic distribution. Bibliography of 50 titles.

Diseases and Parasites: Protozoa, Sarcocystis

Erickson, Arnold B. Incidence and transmission of Sarcocystis in cottontails, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 44-46.

Review of literature (8 titles cited); incidence of Sarcocystis leporum in the Minnesota cottontails examined was 30:78. Gross and microscopic appearance of the cysts and their inhabitants are described. Experiments in transmission were rather inconclusive; a domestic rabbit confined with cottontails had a few cysts; it may have acquired the parasites by eating food contaminated by droppings of the wild rabbits.

Diseases and Parasites: Protozoa, Trypanosoma

Nigrelli, Ross F. Trypanosomes from North American amphibians, with a description of Trypanosoma grylli Nigrelli (1944) from Acris gryllus (LeConte), Zoologica (New York Zoological Society, Zoological Park, New York 60, N. Y.), 30(1), April 1945, pp. 47-56, 1 pl., 4 figs.

Original description of the species mentioned was in Journ. Parasitology Suppl., 30(9), 1944; it is copied here and figures are presented; type locality: Georgia. This paper summarizes information on its subject, describes some of

the species and presents measurements of 10, tabulates the results from examination for trypanosomes of nearctic amphibians, and discusses the correlation between serological reactions of the hosts and the occurrence of trypanosomes in them. Bibliography of 21 titles.

Diseases and Parasites: Siphonaptera, Conorhinopsylla

Jellison, William L. Siphonaptera: A new species of Conorhinopsylla from Kansas, Journ. Kansas Entomological Soc. (University of Kansas, Lawrence), 18(3), July 1945, pp. 109-111, 3 figs.

C. nidicola from nests of wood rats (Neotoma floridana), description, illustrations, comparative notes; remarks upon hosts of species of this and related genera.

Diseases and Parasites: Trematoda, Prosthodendrium

Manter, H. W., and Jeanette S. Dobus. Two trematodes from a hibernating bat, Myotis californicus, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan), 54(4), Oct. 1945, pp. 297-299, 1 pl.

Report on species from a Nebraska bat, one of which Prosthodendrium oligolecithum is described as new; measurements, description, illustrations, comparative notes. Bibliography of 6 titles.

Diseases and Parasites: Of bobwhite

Ward, J. W. A new locality record for five species of helminth parasites of the bobwhite quail, Proc. Helminthological Society of Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md.), 12(2), July 1945, pp. 71-72.

Four nematodes and 2 cestodes from Mississippi specimens.

Diseases and Parasites: Of deer

Herman, Carlton M. Some worm parasites of deer in California, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 31(4), Oct. 1945, pp. 201-208, Figs. 63-64.

Descriptions and sketches intended to aid sportsmen in recognizing common species, including the eye, foot, body, blood, lung, stomach, and intestinal worms, also the whip worm, liver fluke, tapeworms, and bladder worms. There are notes on life history and pathology of some of the forms.

Diseases and Parasites: Of muskrat

Rausch, Robert L. Parasites of Ohio muskrats, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, p. 70, 1 table.

Tabulation of incidence and comment on lesions, and pathology (scant); trematodes (4 sp.), nematodes (2), and cestodes (2).

Diseases and Parasites: Of skunk

Junod, Fred L. Pleuritis in wild skunk, Journ. Mammalogy (William H. Burt, Museum of Zoology, University of Michigan, Ann Arbor. $1.00 a copy), 26(3), Aug. 1945, pp. 309-310.

Symptoms and lesions of an Ohio specimen; the malady involved may be one of the causes of an observed general reduction in skunk numbers.

Diseases and Parasites: Of snakes

Hinshaw, W. R., and E. McNeil. Salmonella types isolated from snakes, Amer. Journ. Veterinary Research (600 S. Michigan Ave., Chicago, Ill. $1.25 a copy), 6(21), Oct. 1945, pp. 264-266.

Methods and results of a study in California. Authors' summary: "(1) A total of 11 (26.8%) of 41 snakes caught on ranches in seven localities yielded Salmonella. One (7.1%) of 14 snakes from zoo exhibits also yielded a Salmonella; (2) five types have been isolated: Salmonella meleagridis, Salmonella typhimurium, Salmonella newport, Salmonella rubislaw, and Salmonella panama; (3) this relatively high incidence in snakes on ranches indicates that reptiles, like birds, may serve as important reservoirs of Salmonella. This might well have a public health significance; (4) these isolations again illustrate the wide range of host-parasite adaptation displayed by Salmonella." Bibliography of 5 titles.

Ecology: Bird resistance to cold

Moore, A. D. Winter night habits of birds, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 57(4), Dec. 1945, pp. 253-260.

Discussion of heat production, and temperature regulation, heat loss mechanisms, and enclosed and open roosts, with suggestions on observing, recording, and reporting, and the need for much further study.

Ecology: Desert mammals

Hardy, Ross. The influence of types of soil upon the local distribution of some mammals in southwestern Utah, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 15(1), Jan. 1945, pp. 71-108, 19 figs., 14 tables.

Review of allied literature (2-page bibliography), description of the area and methods of the study, the ecologic associations, and factors that influence the local distribution of plants and mammals. Correlations pointed out are with: soil texture, chemical composition, moisture, depth, gradient, and color.

Ecology: Desert mammals

Vorhies, Charles T. Water requirements of desert animals in the Southwest, University of Arizona (Tucson), Technical Bul. 107, pp. 485-525, 4 pls., 9 figs.

Review of previous work on the subject, description of study area and methods, and account of the life histories with special emphasis on food and water relationships of: kangaroo rats, pocket mice, white-throated wood rat, ground squirrels, and jack rabbits. Characteristics of the "micro-climates" in which these animals live are discussed and graphed and mesquite forest ecology is contrasted to that of the desert. From author's summary: "The kangaroo rat (Dipodomys spectabilis) eats mostly air-dry food, mainly seeds, with a minimum water content, yet the animal seldom if ever takes free water. Its deep burrowing and nocturnal habits and its physiology conserve water. The wood rat (Neotoma albigula) does not drink, but uses more succulent food. It is less strictly nocturnal than Dipodomys and lives in a shallower and less well-protected burrow. The round-tailed ground squirrel (Citellus tereticaudus) uses much succulent food and drinks when water is available. Its diurnal habit requires more moisture, which is partially compensated for by a deep burrow into which it may retreat during the hottest hours, and in which it lies dormant through the autumn drought. The jack rabbits (Lepus spp.) are mainly nocturnal, but have no such shelter as a burrow against heat and desiccation by day. Only under most unusual circumstances do they drink, perhaps never in their normal existence. The more they need water, the less likely is it to be available. Their food is highly succulent, mainly mesquite and cactus, with the latter increasingly consumed as drought conditions increase. A comparison of the climate of the mesquite forest with the adjacent desert mesa shows a less extreme climate in the forest, especially as to atmospheric humidity and soil-surface temperature. Nevertheless more mammals, both as to species and individuals, live in the desert environment. This is especially true of the Heteromyidae, the kangaroo rats and pocket mice."

Ecology: Field borders

Dambach, Charles A. Some biologic and economic aspects of field border management, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 169-184, 5 figs., 4 tables.

The wildlife manager sees that the one great opportunity for benefitting wildlife on farms lies in revegetation of field borders. Yet objection to the presence of woody plants there is of long standing in American agriculture. In Ohio a law of 1885 required landowners to cut brush, briers, thistles, and other weeds along fences, though this was modified in 1904 to permit the planting of vines and trees for use. Vegetated fence rows reduce the acreage of land available for crops and shelter certain pests. On the other hand, they harbor enemies of crop-destroying insects and have other values. The author reports on his studies of field borders in southwestern Ohio, dividing them into 6 classes, the proportions of which were as follows: Clean tilled borders (3.1 percent), woody or herbaceous (6.2), grass sod (61.4), grass and shrub (22.4), shrub (5.9), and Osage orange (11.0). Widths, effects on crops,

insect, rodent, and bird populations are discussed and the findings summarized as follows: "(1) Field borders are an essential part of the farming pattern whenever livestock are included in the farm enterprise; (2) there is a minimum width of field border below which efficient use of farm equipment is impractical. By observation and measurement on farms using modern farm equipment, this width was found to be approximately 4 feet (considering both sides of fenced borders); (3) border width in excess of 4 feet represents a loss in potentially productive land without reduction in the tax load; (4) crop field borders supporting vegetation more than 6 feet in height may cause a material reduction in the yield of cultivated crops immediately adjacent to the border. The area so affected may extend two or more rods into the cultivated field; (5) crop field borders harbor larger numbers of insects including injurious and beneficial species and species of no economic importance on a unit of area basis than do adjacent crop fields; (6) crop field borders harbor larger populations of small mammals such as mice and shrews (at least during the winter months) on a unit area basis than do the adjacent crop fields; (7) the more nearly the vegetation in a crop field border is related to the adjacent crops, the greater is the danger of its serving as a carter for infestation of crops by insect and small mammal pests; (8) the clean tilled, sod and weedy or herbaceous types of field borders are more important as sources of grain and forage crop pests than are woody borders. The converse is true of truck and most orchard crops; (9) field borders composed largely of woody plants are occupied by many more nesting birds than are nonwoody borders and greatly exceed in numbers of nesting pairs comparable areas of crop fields." Bibliography of 22 titles.

Ecology: Fish-eating birds

Mills, H. R. Water-fowl ecology, Florida Naturalist (R. J. Longstreet, 610 Braddock Ave., Daytona Beach, Fla.), 18(1), pp. 1-7, 1 pl.

Eleven years of protecting piscivorous birds in Tampa Bay has produced evidence that they are of "inestimable value to all forms of aquatic life and without which fish would probably become extinct." As the rookeries have increased in size, the droppings have fertilized the waters and the "pasturage of the sea" has produced a great increase in commercial fish.--R. J. Longstreet in Biological Abstracts.

Ecology: Fur animals, Illinois

Yeager, Lee E. Capacity of Illinois land types to produce furs, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 79-86, 3 tables.

The land types chosen, from which the great bulk of Illinois furs are taken, are described, and particulars are given as to the sample areas. Preferences of fur animals among these habitats have a good deal to do with the per acre catches and values. These are tabulated, the highest value, namely $11.59, characterizing ditches. Ungrazed ditch habitat had a per acre income about 11 times greater than grazed ditches. "Income on all types was directly proportional to the muskrat harvest." "Furs represent only a part of the wildlife yield on uncultivated lands, since most of the upland and other game is produced on the same areas. Management that insures the production of this

multiple wildlife crop involves no practice adverse to progressive agriculture." Bibliography of 10 titles.

Ecology: Hedge-row

Crawford, Bill T. Hedge fences and prairie wildlife, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 6(6), June 1945, pp. 10-12.

The author summarizes the history of the osage-orange [Toxylon pomiferum] hedge fence, beginning with original cover on Missouri prairies, its reduction by farming, popularization of the hedge fence as the answer to the early farmer's fencing problem, its value to wildlife, its decline in favor as wire fencing came in, and the effects of agriculture and clean fence-rows on prairie wildlife. Censuses by Commission technicians show that prairie areas with hedge fences produce many more quail [Colinus v. virginianus] and cottontail rabbits than similar areas with clean fence-rows. This cover is being reduced in the interests of clean farming, because woven wire is more efficient, and because grain production near hedges is reduced. Studies by agricultural investigators show values in erosion control and reduction of evaporation, post production and wildlife production that may often overbalance the detriments. Impartial studies involving all aspects of the problem should be made to determine the basis for practical procedures in the future.--W. O. Nagel in Biological Abstracts.

Ecology: Juniperus

Hahn, Henry C., Jr. Cedar important to wildlife, Texas Game and Fish (Walton Bldg., Austin, Texas. 10 cents a copy), 3(12), Nov. 1945, pp. 27-28, 2 photos.

Juniperus species, favored by rarity of fire and overgrazing, have invaded much grassland in Texas and extensive control campaigns have been undertaken. They should be modified, however, where serious erosion may result and the values of cedars to man and to wildlife should not be forgotten.

The following article describes Juniperus invasion and suggests control methods: Juniper comes to the grasslands, Kenneth W. Parker, American Cattle Producer (515 Cooper Bldg., Denver 2, Colo., Nov. 1945, reprint, 4-page folder, 3 photographs).

Ecology: Overpopulations

Leopold, Aldo. Deer irruptions, Trans. Wisconsin Acad. Sci., Arts, and Letters (211 Genetics Bldg., University of Wisconsin, Madison), 35, 1943, pp. 351-366.

Review of the histories of deer irruptions in Utah, Michigan, and Pennsylvania; consideration of these outbreaks under the headings of common characters, winter deer behavior, limitations of artificial feeding, predisposing events, and typical sequence of the phases of irruptions. Serious overpopulation of deer in Wisconsin seems imminent. Bibliography of 27 titles.

Ecology: Pheasant

Allen, Durward L. What happened to the pheasant?, Michigan Conservation (Mich. Dept. of Conservation, Lansing 13), 15(1), Jan. 1946, pp. 6-8, 4 figs., 1 table.

In 1943-44, pheasants were so common that much complaint of agricultural damage resulted; in 1945, they were much less numerous. The author, discussing possible causes, states that winter food, legal shooting of cocks, predators, and diseases are not the factors causing decrease in the pheasant population of Michigan. Hatch and survival of chicks are the important elements; examples are recounted. Heavy precipitation in May and June is correlated with poor returns from hunting; best bags have been made in years of less rainfall. The author sensibly says: "We could spend a great deal of money upon things that will not work. Or we can keep our balance and learn from the emergency."

Ecology: Range rodents

Bond, Richard M. Range rodents and plant succession, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 229-234.

Jack rabbits and various rodents are more numerous on depleted and weedy ranges rather than on those in good condition, and their presence thus is an indication of overgrazing. A common view is that these animals eat grass, therefore compete with livestock, and thus injure the rancher. However, "it is seldom pointed out that where serious competition exists, it is usually for a very inferior type of forage" and that rodents exert a dynamic force on range investigation, the effects of which should be a matter of observation, not of mere inference. The author discusses evidence for several groups and concludes that "the possibility is strongly suggested that some range rodents, under some conditions, may assist in the recovery of deteriorated ranges by differential pressure on plant species typical of early successional stages. Studies to investigate the possibility would be very desirable, and future studies of any kind on range rodents should endeavor to test this hypothesis." Bibliography of 30 titles.

Ecology: Small mammals

Hamilton, William J., Jr., and David B.Cook. Small mammals and the forest, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 137-139.

An exceedingly condensed and authoritative statement of the populations (often 100 and sometimes 200 to an acre), fluctuations, habitats, food, relation to forests, and role as buffers, of mammals from the size of the chipmunk and flying squirrel down. "The small mammals are numerous, active, and important elements in the biology of the forest. Certain of their acts--notably the eating of tree and shrub seeds--are often considered detrimental to the forest but plants produce seed so lavishly that even a heavy loss may not be critical. In the process of digging burrows and searching for food, they stir up, mix and

loosen the soil. They form a considerable portion of the food of hawks, owls and some of the fur bearers and act as buffers to protect more useful and valuable game birds and animals. They exercise a potent and ever-present check on forest insects and other invertebrates. Without small mammals, our forests would be less productive, more subject to insect epidemics, and certainly less interesting and enjoyable places."

Ecology: Snowy owl migration

Shelford, V. E. The relation of snowy owl migration to the abundance of the collared lemming, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 62(4), Oct. 1945, pp. 592-596, 1 fig., 1 table.

Correlation of records 1929-1942 indicated that the birds came south following years in which there was a sharp decline in lemming population. Their own numbers appear to be reduced for one or more years subsequent to a southward migration. Bibliography of 11 titles.

Ecology: Utilization of Japanese honeysuckle

Handley, C. O. Japanese honeysuckle in wildlife management, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 261-264, 1 table.

The plant provides excellent cover in latitudes where it retains its leaves in winter, and is of some food value to the bobwhite, wild turkey, certain songbirds, and the white-tailed deer. The author presents a table comparing the nutritive value of the fruit with corn and of the foliage with timothy hay. Disadvantages of the plant also are considered and care in its use is urged. It can be kept in check by fire and grazing. Bibliography of 8 titles.

Ecology: Wolf trees

Elliott, Charles. Woodman, spare that "wolf" tree!, American Forests (919 Seventeenth St., Washington 6, D. C. 35 cents a copy), 51(10), Oct. 1945, pp. 489-490, 3 figs.

Value of these trees as nesting, denning, and storing sites for woodpeckers, starling, bluebird, screech owl, opossum, raccoon, squirrels; general value of insectivorous birds to the forest. "Those who know its place in the ecology of the forest will agree with me that these ugly wolf trees, these snags, these trees classified as worthless space fillers, are valuable wildlife units in the vast stretch of North American woodland."

Education: Conservation

Gabrielson, Ira N. Education and wildlife conservation, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 205-209.

Much of the present effort is expended on those who are already converts to general conservation, and while this is useful, the great need is for getting the message to the general public. Of basic importance is conservation education in schools of all ranks. It should be true to history in telling of failures as well as successes, should emphasize the interdependence of all conservation activities, and should point out existing needs. Modern methods of instruction should be fully utilized, not forgetting, however, the well-known value of repetition. Already we have more material available than we are using and the organization of an extension service in wildlife conservation is a great desideratum.

Education; Conservation

McCullough, George W. Extension specialists for wildlife a necessity, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 212-215.

Addition to the existing Extension Service and Vocational Agriculture personnel of specialists trained in game management (as well as in agriculture)--a plan proposed because of public acceptance of the Extension Service and of resistance to the intrusion of new Federal agencies.

Education: Outdoor

Palmer, E. Laurence, et al. Outdoor laboratories, Cornell Rural School Leaflet (Ithaca, N. Y.), 39(1), Fall 1945, 63 pp., illus.

Natural history study areas in the vicinity of Cornell University described; sketch of New York State teachers college natural history reserves; account of New York State parks and reservations; notes on the national park system; suggestions as to private outdoor laboratories, window nature study, and school grounds designed for teaching. Lists of books on outdoor living.

Education: Recognition of tracks

Treat, Dorothy A. Track stories in mud, sand and snow, School Nature League Bul. (National Audubon Society, 1006 Fifth Ave., New York 28, N. Y. 10 cents a copy), 16(4), Dec. 1945, 4 pp., 11 figs.

Illustrated suggestions on recognition of tracks as a means of reading the story of wildlife; games using reproductions of animal tracks. Brief list of recommended reading.

Food Habits: Birds vs. bees

Grant, Chapman. Drone bees selected by birds, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 47(6), Nov.-Dec. 1945, pp. 261-263.

Summary of field observations in California and elsewhere on birds that eat bees and of study of collected specimens indicating the extent to which drones are taken. List of 37 species in the stomachs of which the Fish and

Wildlife Service has found honeybees, to which the records in this paper add 3 from the United States.

Food Habits: Malnutrition

Harris, Dave. Symptoms of malnutrition in deer, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 319-322, 2 tables.

Winter feed is of distinctly poorer quality than that available in summer and the animals lose condition. External and internal evidences of malnutrition are described. Analyses of the stomach contents of deer dying during the winter are summarized. "The change from good to poor physical condition takes place within six weeks."

Food Habits: Nutritional analyses

Treichler, Ray, Richard H. Stow, and A. L. Nelson. Nutrient content of some winter foods of ruffed grouse, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 12-17, 3 tables.

Authors' summary: "Seventeen preferred grouse foods were collected during the late winter and analyzed for nutrient content. The results include moisture, crude protein, ether extract, crude fiber, nitrogen-free extract, ash, calcium, phosphorus, and gross energy content expressed both on moisture free and fresh bases. The preferred winter foods of grouse are characterized by a high content of dry substance and of nitrogen-free extract. On the basis of nutrient content, the foods examined are well qualified as sources of energy and other essential nutrients required for maintenance of grouse during the winter season." Bibliography of 13 titles.

Food Habits: Role of buffer species

Darrow, Robert W. Relation of buffer species abundance to fox predation on grouse nests, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 270-273, 2 figs.

A study of these species in New York is outlined, from which it appears that in the scarcity of buffer food, foxes hunted the area more intensively and destroyed a greater proportion of grouse nests than when the buffer species were abundant.

Food Habits: Salt eating

Packard, Fred M. Some observations of birds eating salt, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 63(1), Jan. 1946, p. 89.

Notes on several species and reference to a previous publication on the subject. The immediately following article by H. Mousley gives two additional references.

Food Habits: Squirrel damage to pine

Schantz-Hansen, T. Red squirrel damage to mature red pine, Journ. Forestry (825 Mills Bldg., Washington 6, D. C. 50 cents a copy), 43(8), Aug. 1945, pp. 604-605, 1 table.

In Minnesota; clipping off branch tips for unknown reasons; note also on stripping of bark of jack pines. Comment: Is not twig clipping done both in deciduous and coniferous forests wherever there are squirrels in the United States?

Food Habits: Of bobwhite

Allen, Ralph H., Jr., and Allen M. Pearson. Ol' bobwhite's November menu, Alabama Conservation (Alabama Dept. of Conservation, Montgomery 4), 17(5), Nov. 1945, pp. 8-9, 10, 1 photo, 1 map, 1 table.

Summary of contents of 149 crops collected in southeastern Alabama; vegetable foods comprised nearly 97 percent, of which acorns, sweetgum seeds, and peanuts were the leading items. No seeds of Lespedeza sericea were found.

Food Habits: Of bobwhite

Allen, Ralph, Jr., and Allen M. Pearson. December diet of whistlin' Bob, Alabama Conservation (5-7 North Bainbridge St., Montgomery 4, Ala.), 17(6), Dec. 1945, pp. 8-9, 12, 14, 4 photos, 1 graph, 1 map.

Report on the contents of 592 crops from southeastern Alabama. Animal food 2.52, vegetable 97.48, percent, by volume. Mast from woody plants was the largest item, 45.40 percent, and seeds of legumes second, 44.37 percent.

Food Habits: Of deer, white-tailed

Cook, David B. Summer browsing by deer on cut-over hardwood lands, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 60-63, 1 table.

Discussion of previous pertinent literature, description of the study area, classification of available plants as to degree of browsing, and discussion of the relation of deer to woodland management. Author's summary: "On recently clear-cut hardwood forest land in Rensselaer County, New York, white-tailed deer have exhibited marked selectivity in summer feeding. New sprouts of grey birch, hard maple, and white ash and of several less abundant species were heavily fed upon, while other trees and shrubs were lightly used or completely ignored. Small seedling trees were definitely less attractive than new sprouts of the same species. Where such cut-over land is being converted by planting conifers, deer browsing may be of some assistance in keeping down the hardwood sprouts. Where regeneration is being sought by any method involving substantial opening of the forest canopy, hardwood reproduction will usually be so abundant that deer damage will be of little consequence,".

Food Habits: Of goshawk

Ingles, Lloyd G. Nesting of the goshawk in Sequoia National Park, California, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 47(5), Sept.-Oct. 1945, p. 215.

Notes on prey, including ground squirrel, chipmunk, flicker, and jay.

Food Habits: Of grouse, ruffed

Anon. [Stomach contents of ruffed grouse], Rapport Annuel Societe Provancher 1944 (85 des Franciscains, Quebec, Canada), 1945, pp. 53-55.

Food items identified by the Fish and Wildlife Service from 19 specimens, presumably from Quebec.

Food Habits: Of grouse, ruffed

Brown, Charles P. Food of Maine ruffed grouse by seasons and cover types, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 17-28, 2 tables.

Methods of the study are described and the results obtained from study of 265 digestive tracts are discussed as indicated in the title. Author's summary: "(1) The correlation between food availability and usage is highest in the old field and orchard type. This type offers considerable food, but a minimum of shelter at all seasons and is frequented by grouse primarily for feeding; (2) the correlation is lowest where softwoods predominate, a type of cover offering maximum shelter and used chiefly during adverse weather or for resting; (3) the principal foods taken in each cover type were as follows: (a) mixed growth types--aspen, hazelnut, clover, willow, and wild cherry; (b) upland hardwoods--aspen, clover, wintergreen, birch, and hazelnut; (c) lowland hardwoods--aspen, willow, hazelnut, apple, and clover; (d) old fields and orchards--apple, hawthorn, and sumac. Some foods apparently had been taken in types other than those in which the birds were collected; (4) grouse in Maine subsist largely on catkins and buds in winter and early spring; on fruit, leaves, and insects in summer; and on leaves, fruit, catkins, and buds in autumn. Animal food is of significance only in summer; (5) aspen is the most important single year-round food of ruffed grouse in Maine, being of first importance in winter and spring. The buds are eaten during these seasons, and in autumn the leaves are also of significance in the diet. The three other most important items, on an annual basis, are hazelnut, apple, and clover. Wintergreen occurs among the 10 most important foods for each season, except winter, when it ranks eleventh. There is high usage of hazelnut and clover in Maine by comparison with the results of investigations in other parts of ruffed grouse range." Bibliography of 12 titles.

Food Habits: Of gull, California

Cottam, Clarence. California gulls feeding on midges, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 47(5), Sept.-Oct. 1945, p. 216.

Reference to a variety of foods taken by these gulls, including observations of their feeding on abundant, recently-emerged Chironomidae.

Food Habits: Of hare, snowshoe

Cook, David B., and Stacy B. Robeson. Varying hare and forest succession, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 26(4), Oct. 1945, pp. 406-410, 2 figs.

From an original state-wide range, the hare has now been reduced to occupancy of soft-wood swamps, mostly in the Adirondacks. The study area is described and the feeding habits and populations of the hare are discussed, especially in relation to forest succession. The hare has become a serious handicap to reforestation in Lake States and sometime in the future may play a similar role in the Northeast. Bibliography of 6 titles.

Food Habits: Of hawks

Baumgartner, F. M. Know your hawks, Oklahoma Game and Fish News (Oklahoma Game and Fish Commission, Oklahoma City), 1(12), Dec. 1945, pp. 4-5, 6-8, 2 photos, 2 charts.

Account of hawks in relation to a 75 percent decrease of quail on the Lake Carl Blackwell area. Hawk abundance was correlated with that of the quail, reducing when the birds largely vanished during and following three weeks of snow and very cold weather. However, the hawks were feeding chiefly on mice and cotton rats. "The disappearance of the quail was due in part . . . to lack of winter food caused by the consumption of most of the weed and grass seed by these rodents." When these animals died off in tremendous numbers the hawks left. The bobwhites rapidly recovered from their winter losses and became even more plentiful than before. The author sharply differentiates the Accipiters or blue darters from other hawks and urges sportsmen to learn to distinguish them and to refrain from shooting the more beneficial species. The charts are those prepared by the National Audubon Society to illustrate the food habits of hawks and characteristics for identifying the birds.

Food Habits: Of jay, California

Cowles, R. B. Snail-eating by the California jay, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 47(6), Nov.-Dec. 1945, p. 269.

Feeding on the introduced garden snail (Helix aspersa).

Food Habits: Of jay, California

Michener, Harold, and Josephine R. Michener. California jays, their storage and recovery of food, and observations at one nest, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 47(5), Sept.-Oct. 1945, pp. 206-210, 1 fig.

Notes on storing of nuts and other foods; some but not all of it is recovered; method of opening walnuts; parts of kernels lost are eaten by other birds; notes on nesting, territorial behavior, and history of an unsuccessful nest.

Food Habits: Of owl and shrike

Brooks, Allan. Two small predators, Canadian Nature (177 Jarvis St., Toronto, Canada. 25 cents a copy), 7(5), Nov.-Dec. 1945, pp. 158-161, 5 figs.

Pigmy owl (Glaucidium gnoma); appearance and habits, especially as to predation; summary of 36 stomach examinations. Northern shrike (Lanius borealis); predation, especially on ptarmigan chicks; defeat in a clash with a pigmy owl.

Food Habits: Of pocket gopher

Aldous, C. M. Pocket gopher food caches in central Utah, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 327-328, 1 table.

Report on the plant materials (and their weights) found in 5 caches under ground and 5 under snow. Dandelion roots were most prominent in the former, and spring beauty tubers (?) in the latter, stores.

Food Habits: Of snake, garter

Lagler, Karl F., and J. Clark Salyer, II. Influence of availability on the feeding habits of the common garter snake, Copeia (M. Graham Netting, Carnegie Museum, Pittsburgh, Pa. $1.00 a copy), 3, Oct. 1945, pp. 159-162, 2 tables.

Where fishes are readily available, the garter snake feeds freely upon them. Food items are reported for 35 specimens taken about natural waters and 100 from fish-rearing stations. "Availability is a factor in determining food habits; . . . unusual concentrations of prey organisms invite reduction of their numbers at a temporarily increased rate even if departure from usual habit or other response on the part of the predator is involved."

Life Histories: Antelope, Prong-horned

Throckmorton, Michael. The pronghorn, Texas Game and Fish (Walton Bldg., Austin, Texas. 10 cents a copy), 4(1), Dec. 1945, pp. 14, 23-24, 1 fig.

Comment on distinctive characteristics of the animal, especially its horns for which maximum measurements are given. Notes on gaits, speed, reproduction, young, social habits, and food. Competition with livestock and reduction and restoration in its numbers also are discussed. There are about 9,000 pronghorns in Texas.

Life Histories: Armadillo

Taber, F.Wallace. Contribution on the life history and ecology of the nine-banded armadillo, Journ. Mammalogy (Wm. H. Burt, Museum of Zoology, University of Michigan, Ann Arbor. ($1.00 a copy), 26(3), Aug. 1945, pp. 211-226, 1 table.

Summary of the author's observations on environmental relationships, dens and nests, daily and seasonal movements, swimming, food habits, appearance and behavior of young, and animal associates of the species in Texas. Bibliography of 9 titles.

Life Histories: Badger

Miller, W. L. Status of the badger in North Dakota, North Dakota Outdoors (State Game and Fish Dept., Bismarck, N. Dak. 5 cents a copy), 8(5), Nov. 1945, p. 6, 1 fig.

Characteristics and habitat are briefly noted. There is some foundation for the claims that badgers catch poultry, kill lambs, and that their burrows are a menace to horses and riders, but these charges do not justify wanton destruction of the animals. In food habits, badgers, on the whole, are highly beneficial. Their chief food in North Dakota is the Richardson ground squirrel, and other burrowing rodents are taken. Two or three ground squirrels or a dozen mice may be disposed of by a single badger daily. Attacks upon poultry both by badgers and foxes probably have increased because of the eradication of rodents. Limited control may now be desirable but should cease when the rodent population returns to normal. It should be by trapping, directions for which are given. Bounties are not available and generally are undesirable.

Life Histories: Bobcat

Foote, Leonard E. Sex ratio and weights of Vermont bobcats in autumn and winter, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 326-327, 1 table.

Weights of 376 specimens summarized; 101 males averaged 19.4 pounds and 250 females 14.5 pounds.

Life Histories: Canvas-back

Smith, Donald J. The canvas-back in Minnesota, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 63(1), Jan. 1946, pp. 73-81, 3 tables.

Vegetation of Lake Christina where the study was made; it has "tremendous volumes" of sago pondweed upon which the canvas-backs principally feed. Life history of the species is discussed under the headings of spring migration, courtship, sex ratio, nesting, and fall migration. Hunting is described and information presented on sex and age of birds in hunters' bags.

Life Histories: Dove, Mourning

Mc Clure, H. Elliott. Mourning doves in Nebraska and the west, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 63(1), Jan. 1946, pp. 24-42, 12 tables.

Contributions to the life history, principally nesting habits, based on studies in Iowa, Nebraska, and California.

Life Histories: Elk, Roosevelt

Schwartz, John E., II, and Glen E. Mitchell. The Roosevelt elk on the Olympic Peninsula, Washington, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 295-319, 1 pl., 3 figs. (maps), 11 tables.

Report on a cooperative investigation of management possibilities for this subspecies. The life history account covers weights and measurements, age and sex classes, molt, herding, antler development, mating and breeding, migratory and other movements, feeding habits, and winter and summer ranges. Plant utilization is rather fully discussed and contents of 25 stomachs are reported. The principal browse species are vine maple, huckleberry, and salmonberry, but certain conifers are much used. Winter losses, malnutrition, diseases, parasites, and predators receive attention. Local overpopulation prevails and predation is far from sufficient to offset it. Agricultural damage was practically relieved only by the construction of elk-proof fences.

Life Histories: Muskrat

Sooter, Clarence A. Muskrats of Tule Lake Refuge, California, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 68-70, 1 table.

Introduced in 1930, the muskrats multiplied so that trapping was permitted in 1934-35. In 1943-44, under management as a Federal wildlife refuge, a trapping quota of 25,000 was allowed. Sex and age data are summarized for 1,530 individuals, as are weights and measurements for lesser numbers. Characters of upper incisors, placental scar counts, and size of tests also are treated.

Life Histories: Pheasant

Mohler, Levi. Around the calendar with pheasants, Outdoor Nebraska (State Game, Forestation, and Parks Commission, Lincoln), 23(3), Fall 1945, pp. 14-16, 7 photos.

Concise account of factors influencing the pheasant population throughout the year in Nebraska.

Life Histories: Salamander, Tiger

Cozort, C. E. Salamanders, North Dakota Outdoors (State Game and Fish Dept., Bismarck, N. Dak. 5 cents a copy), 8(5), Nov. 1945, pp. 13-14.

The article is mostly devoted to the tiger salamander (Ambystoma tigrinum), whose appearance, habitat, life history, and economic relations are considered. Food of both immature and adult stages is noted; "the salamander will eat anything that doesn't eat it first." They eat a great many fishes but in turn are preyed upon by fishes as well as by the white pelican. In natural waters their role tends to a balance but in nursery ponds and newly created waters, they may need control.

Life Histories: Squirrels

Brown, Louis G., and Lee E. Yeager. Fox squirrels and gray squirrels in Illinois, Bul. Illinois Natural History Survey (Urbana): 23(5), Sept. 1945, pp. 449-536, frontisp., 42 figs., 29 tables.

The objects of the study are set forth and its methods are described. The results are reported in terms of: population density, species and sex ratios, age classes, species competition, daily activity, seasonal movements, weights, measurements, molt and color, parasites and diseases, predation, breeding, rearing of the young, habitats, foods and feeding, and nests and dens. Some of these topics were thoroughly worked and much original information is presented. Hunting is analyzed and management suggestions are made. 3-1/2 page bibliography. An excellent paper.

Life Histories: Turtles

Pope, Clifford H. Turtles, School Nature League Bul. (National Audubon Society, 1006 Fifth Ave., New York 28, N. Y. 10 cents a copy), 16(2), Oct. 1945, 4 pp., 6 photos.

General account of the paleontological history, structure, food and feeding, reproduction, age, growth, and size, senses and intelligence, conservation, and care in captivity. List of 5 books for recommended reading.

Management: Bobwhite

Baumgartner, F. M. Management of bob-white on the oak-tall grass prairie, north central Oklahoma, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 135-190, 1 table.

Description of the area, farm practices thereon, and experiments in management, together with suggestions on habitat improvement. Author's summary: "A 5-year study of bob-white management near Stillwater in north central Oklahoma indicates the following relationships: (1) Adequate winter food and cover are limited chiefly to timbered or brushy ravines and patches of oaks when such associations are bordered by cultivated or idle croplands; (2) overgrazing materially reduces fall population and forces coveys to abandon ranges

in the late winter. Light to moderate grazing pressure does not appear to reduce seriously the winter carrying capacity; (3) fall and early winter fires destroyed covey ranges for that season. Late winter fires forced coveys to shift to new ranges and affected the population as much as a year later; (4) food patches far removed from cover do not appear to provide new covey ranges for bob-white and are not considered consistent with good range management; (5) winter feeding is desirable on areas where natural foods are limited; (6) pole and board shelters do not provide adequate escape cover. Fences of oak limbs, large piles of tree tops, and felled trees furnish satisfactory cover; (7) plantings of ornamental and shade trees and shrubs about farm homes and black locust post lots may provide sufficient cover and food to meet the winter requirements of bob-white; (8) normal hunting does not appear to be an important limiting factor since the average winter loss is about 50 per cent of the fall population regardless of the presence or absence of hunting." Bibliography of 5 titles.

Management: Cooperative

Presnall, Clifford C. Teamwork in game management, State Government (1313 East 60th St., Chicago 37, Ill. 35 cents a copy), 18(10), Oct. 1945, pp. 181-183, 192.

As the preservation and management of wildlife must be coordinated with the general conservation program, it is a proper responsibility of all governmental units from local to Federal. As there are an estimated 16 million persons engaged in outdoor sports (spending 2 billion dollars annually therein) and 14 million other outdoor recreationists, all of whom are greatly interested in wildlife, its conservation and management are clearly big business. The difficulties of cooperation are illustrated by the Modoc deer problem in two states and involving the Forest Service and organized cattlemen and sportsmen, yet agreement has been obtained on an ameliorative program. Similar cooperation in "live and let live" policies are needed throughout the western states. The slogan "more game and livestock" should be replaced by that of "more grass and browse" so that range improvement will succeed range deterioration. There is great need of cooperative spirit also in the management of farm wildlife (a surprising proportion of the entire production). Field-border management as developed in the southeastern states is cited (and described) as a real success in this troublesome sphere. Extension of cooperative management to other phases of wildlife conservation is urged.

Management: Deer, Black-tailed

Einarsen, Arthur S. Management of black-tailed deer, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 54-59, 1 pl., 2 tables.

The author discusses mortality factors, nutritive value of foods (percentage of protein content of 6 species presented), and reports on management studies (embracing age classes and weights of 50 bucks) and possibilities. Author's summary: "The black-tailed deer can live in comparative security in circumscribed areas, making the species the most desirable big game in the

Oregon Coast Range; it requires careful but simple management. Protection of remnant stock after forest fires is essential. Hunting on burned areas before vegetative cover again affords security may eliminate remnants and handicap restoration. The experiences gained on the Tillamook Burn prove the practicability of a temporary refuge to improve hunting. The vegetative succession that followed a forest fire on such range provides deer foods of excellent quality in abundance, as shown by the weights of the deer. The necessary protection period is comparatively short. A closure from October 1939 to October 1942 resulted in increases averaging from less than one to more than 15 deer per section of land. Inspection of deer carcasses killed by the hunters showed them to be free from injurious parasites, a direct result of the fire.

Management: Deer, White-tailed

Foote, Leonard E. The Vermont deer herd. A study in productivity, Vermont Fish and Game Service (Montpelier), State Bul. Pittman-Robertson Series 13, 125 pp., 50 figs., numerous tables, 1945.

An effectively condensed, well organized, and carefully summarized report. History shows that the Vermont herd went through the same cycle as deer did in most northeastern localities, from primitive abundance to near extermination and restoration through restocking and protection. Change in forest composition, resulting from lumbering, and increase in habitat from farm abandonment also were important factors in growth of the herd. Limiting factors are listed in the order of importance as: legal kill, illegal kill, accidents, predation by dogs, bear and bobcat predation, and losses due to weather and malnutrition. The last-named cause of mortality may readily become much more serious unless the herd is carefully regulated. Deer damage claims have been paid in Vermont from 1902 to date and many deer have been shot to protect crops. Information is given on various life-history topics as: sex ratio, weights, measurements, food, and yarding. Hunting success is analyzed and management suggestions are made. The effectiveness of repellents is discussed. The white-tailed deer herd is an extremely valuable unit of the State's natural resources, direct and recreational returns combined being estimated as worth some $500,000 annually. Bibliography of 64 titles.

Management: Drained areas

Penfound, William T., and John D. Schneidau. The relation of land reclamation to aquatic wildlife resources in southeastern Louisiana, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 308-318, 3 tables.

Most of the agricultural reclamation projects in Louisiana have been complete failures, inevitably so from high initial and maintenance costs. Sample areas in both brackish and fresh environments are discussed, ecological changes and effects upon wildlife receiving particular attention. Under management of wet lands, the authors say, "Our observations indicate that drained lands which have been reflooded not only become excellent wildlife areas, but that they usually produce a greater variety and a greater quantity of wildlife than the original marsh or swamp which was drained." The value of dominant plants to wildlife is appraised and management suggestions are made. "In all

projects that reached the drainage stage, the original aquatic environment was eliminated and the endemic wildlife was destroyed. The potential economic return from these plant and animal resources has been estimated (conservatively) at $5.00 per acre per year. This loss has not been compensated by crop returns in the reclained areas, since very little of the land (probably less than 5 per cent) was ever put into agricultural use. At the present time, less than 1 per cent of the area of all drainage projects is under cultivation. However, many of these abandoned (reflooded) projects now constitute some of the finest wildlife areas in the United States. It is not recommended, however, that reclamation projects be initiated to provide such wildlife areas." Bibliography of 6 titles.

Management: Farm game

Fox, Charles K. More game and better hunting, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 16(8), Nov. 1945, pp. 6-9, 14, 31, 6 figs.

Upland game kept plentiful by management on farms in hard-hunted territory. Of 150 acres of Farm A, 35 constitute a refuge on which there is no hunting nor training of dogs. The refuge has good cover, in part planted; it is valueless for crops and is fenced and posted. Travelways are provided from the refuge to food plantings both shrubby and herbaceous and cover is maintained wherever feasible. The plants employed are named. Fence rows, twenty feet wide, are planted to fruit-bearing shrubs and vines. The methods of handling feed patches are described; hunters are excluded to avoid trampling the plants but dogs are allowed to work through them. Winter feeding of cull corn and grit is practiced by ingenious methods, which are described. On Farm B, the backbone of game production also is a refuge (of 14 acres) and feeding is done here to carry brood stock over winter. A type of pole trap is employed from which hawks and owls can be released alive when desired. Pheasant propagation for sale is an objective; the birds are fed a great deal of alfalfa hay in winter.

Management: Farm wildlife

English, P. F. Farming to help wildlife, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 16(8), Nov. 1945, p. 15, 2 figs.

About the same material as in the article, "Havens for wildlife," noticed in WILDLIFE REVIEW, No. 44, October 1945, page 25.

Management: Farm wildlife

Leopold, Aldo. The outlook for farm wildlife. Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 165-168.

Despite the rise of wildlife management, there are three fundamental weaknesses: "(1) Wildlife habitat in fertile regions is being destroyed faster than it is being rebuilt; (2) many imported and also native species exhibit

pest behavior. A general disorganization of the wildlife community seems to be taking place; (3) private initiative in wildlife management has grown very slowly." The writer then discusses, principally on the basis of Wisconsin experience: gains and losses in habitats, runaway populations, and the human background. "It was inevitable and no doubt desirable," he concludes "that the tremendous momentum of industrialization should have spread to farm life. It is clear to me, however, that it has overshot the mark, in the sense that it is generating new insecurities, economic and ecological, in place of those it was meant to abolish. In its extreme form, it is humanly desolate and economically unstable. These extremes will some day die of their own too-much, not because they are bad for wildlife, but because they are bad for farmers."

Management: Farm wildlife

Roper, Hartwell E. A farmer looks at wildlife management, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 197-202.

Attitudes of farmers toward wildlife vary from hostile to helpful, majority opinion being passively friendly. Wildlife helps to control crop pests, has definite food and fur values, and is of social and recreational importance. Like other crops, it requires land and care. Suggestions are made as to vegetating waste spots, contour farming to control erosion and provide "edges," selective cutting of woodland, protecting undergrowth from grazing and fire, planting field borders and food patches, and providing refuges. "Wildlife management should not be a goal by itself, but should be part of an integrated program in which the farmer has caught the spirit of conservation," and that of all resources, not just certain ones. Soil conservation districts promise to do much toward that end. The author is optimistic as to the future of the farm wildlife program.

Reprinted in Pennsylvania Game News, 16(9), Dec. 1945, pp. 4-5, 25 [3 photos added].

Management: Farmer-sportsman relationship

Gordon, Seth. The farmer-sportsman program, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 16(6), Sept. 1945, pp. 4-5, 31, 4 photos, 1 chart.

Working of the Cooperative Farm-Game and Special Wildlife Refuge programs, especially by the aid of Farmer-Sportsman Federations. Sharing of work, cultivation of good relations, providing flushing bars, regulations promoting safer hunting, advice to sportsmen.

Management: Forest management in relation to wildlife management

Fearnow, Theodore C. Forest wildlife and national forest land management practices, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 104-111.

Relates to the Eastern Region (Maine to Kentucky). Sound wildlife management is not incompatible with proper forest management and numerous practices are of benefit to both objectives. Progressive wildlife management also wins public support for forest policies. Planning cutting so that it will result in openings favorable to the production of game foods and maintain desirable interspersion of cover, preserving den trees, bearing wildlife needs in mind in connection with thinning and weeding, reserving permanent clearings and old orchards on abandoned farm land, special planting, and creating edge along roads and trails are some of the methods discussed. "Preliminary conclusions indicate a promising field for integrated wildlife management on national forest areas, with intensity of development varied to meet public needs. Skilled leadership of well-trained wildlife managers serving as staff assistants to forest supervisors is believed to be the keystone of successful operations."

Management: Forest management in relation to wildlife management

Herbert, Paul A. Observations on the incompatability of wood and game production, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 119-125.

"The present tendency in forest regulation is to insist upon management practices which are aimed primarily to produce wood, not wildlife." It is often assumed that good forest management will produce game in quantity but this is not necessarily true. Usually there are not enough openings in the woodland and those made are small and close quickly. The edge is then of most value to wildlife but if bordered by clean-tilled fields will be negligibly productive. Methods of keeping borders inhabitable by wildlife and at the same time maintaining full crop production are suggested. Instead of leaving den trees, it is recommended that artificial dens and bird boxes be supplied. Comment is made on beavers, deer, other mammals, and grouse in their relations to the forest, some of which are destructive. Where wildlife production is a preferred objective, about 25 percent of a woodland should be developed for its use. Bibliography of 10 titles.

Management: Forest management in relation to wildlife management

Titus, Harold. Timber and game--twin crops, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 146-163, 4 figs.

Virgin timber is far less productive of game than is woodland with openings (or "edge") providing food and ground cover. Partial clearing resulted in increase of wildlife but complete clearing and clean farming reduced it again. Carrying capacity is defined and the evils of exceeding it exemplified by the Isle Royale moose overpopulation. The Pennsylvania white-tailed deer is discussed as affected by logging, fires, the buck law, refuges, and reforestation. As the art of wildlife management arose to improve the handling of game crops, so the idea of sustained yield from forests became more widely accepted. Rotation cutting and selective logging create "edge," thus are good for game. Fire is a tool that with great care can be used to advantage. "Foresters, in their

long-range planning, are no longer inattentive to the wants of the sportsman or the demands of the things he hunts. Game is recognized as a cash asset. More important, it is recognized as a crop, to be grown by tried and approved practices and to be harvested intelligently."

Also reprinted in Pennsylvania Game News, 16(6), Sept. 1945, pp. 7-9, 28, and 16(7), Oct. 1945, pp. 8-9, 26, 27.

Management: Fur animals

Cook, Fannye A. Fur resources of Mississippi. Mississippi Game and Fish Commission (Jackson), Survey Bul., 100 pp., 3 charts, tables (processed), 1945.

Information is presented on the value of furs, nationally, and in Mississippi, the need for protection of fur bearers, State regulations affecting the animals, and on fur conservation and management in general. The status of fur resources and the industries utilizing them is set forth in considerable detail for the seasons 1932-33 through 1938-39; total receipts for 5 leading species, more than a million dollars. Part II of the publication deals with the characteristics, habitat, habits, importance, and value of 12 mostly specific groups of fur animals, the account of the raccoon being presented in detail as an illustration of the scope and methods of the investigation. Management suggestions are made.

Management: Fur animals

Nagel, W. O. Fur--a wild crop of great value, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 6(12), Dec. 1945, pp. 4-5, 10, 2 photos.

Furs are in great demand but every pelt means the death of a fur bearer and good management is needed to keep up the supply. The first rule in harvesting is to take pelts only when they are prime. Receipts for furs in Missouri have more than exceeded the total price of the Louisiana Purchase, of which that State is only a small part. The Missouri annual catch far exceeds that of Alaska in number although not in value. Legal protection of fur animals in the State is defined. The points determining quality of pelts and the folly of taking them out of season are noted. Management suggestions are made and the success of some already put in practice is recorded.

Management: Fur resource

Eklund, Carl R. Fur resource management in British Columbia, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 29-33, 1 table.

The registered trap-line system is described and the annual take of fur is tabulated as to species and royalty values, 1926-1942, inclusive. Author's summary: "The registered trap-line system employed in British Columbia during the past 19 years is an excellent fur resource management practice, but requires an extensive territory. There are approximately 5,300 registered lines

in the Province, varying from about 10 to 500 square miles in extent. Large areas allow for a portion to be trapped one year while another rests. Trap-lines usually follow streams or lakes with watersheds as outer boundaries. There is a one-mile reserve between boundaries of adjacent lines. Every trapper submits a return form. There is no prescribed limit to the take, but overtrapping may result in cancellation of the permit. Overtrapping is indicated by fluctuations in annual takes, and confirmed through investigation of the area by a warden. Poaching of beaver has occurred, but can be reduced considerably through a recent regulation requiring that all beaver pelts be officially marked or tagged before they can be sold. Annual returns indicate a marked increase in populations of fox, mink and muskrat, during the last 4 to 6 years, over that for a similar period at the start of the system in 1926. Annual average income for trappers in upper brackets ranges from $2,000 to $5,000 for 6 months of work, with $1,000 as a possible average for all. As much as $10,000 has been made in one year by a single trapper without detriment to the breeding population. Lines can be leased, loaned, or sold, but authority must be granted by the Game Commission. The system appears to be universally favored. Registered trappers have, to a certain degree, become fur farmers, and the majority desire to protect and build up their fur populations, and to crop off only the surplus."

Management: Game birds

Cook, Fannye A. Game birds of Mississippi. Mississippi Game and Fish Commission (Jackson), Survey Bul. 3-R, 103 pp., 2 maps, tables (processed), 1945.

Information compiled from both external and local sources on the distribution, life history, habits, range, population status, importance as game, conservation requirements, and management of the principal species of both resident and migrant game birds. The longer accounts relate to the Canada goose, wood duck, woodcock, mourning dove, wild turkey, and bobwhite. The publication includes also a section on native plants adaptable for use in waterfowl management.

Management: Harvest, muskrat

Lay, Daniel W. The problem of undertrapping in muskrat management, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 75-78.

"Undertrapping occurs when the trapper could have taken more fur without hurting the breeding stock. Overtrapping occurs when the breeding stock is reduced so much that a capacity population cannot be produced for the next trapping season." Mortality occurring from a variety of causes and dispersal may well be reduced by the proper amount of trapping, the value of the animals then accruing to the marsh in which they were produced and not dissipated. Trap lines should be operated continuously and moved from time to time to reduce the proportion of immature animals taken. The author suggests that trapping at the rate of 2 muskrats per lodge is conservative, also that leaving about 10 percent of an area untrapped and trapping the remainder to the point of diminishing returns will preserve sufficient breeding stock. "There is no

point," he concludes, "in managing water levels, constructing levees, eliminating cattle, properly burning and in other ways managing a muskrat marsh unless the increased production . . . is utilized promptly through proper trapping."

Management: Harvest, quail

Steen, M. O. Quail season early or late?, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 7(1), Jan. 1946, pp. 4-5, 2 figs.

On account of the average short life and the great annual turnover in the population of quail (and other upland game birds), most of the harvest consists of birds of the year. Mortality being proportional to immaturity, an early hunting season makes it possible for the guns to harvest birds that would otherwise be lost to other limiting factors. The open season should begin just as soon as the year's crop is mature. However, hunting should not continue past the time when natural causes have taken the bulk of their toll. The survivors then are the birds that must provide the breeding stock for the next season. Regulations should be designed to make as much wildlife as possible available to hunters, yet should assure maintenance of the game populations.

Management: Inventory, game and fur animals

Duck, L. G., and Jack B. Fletcher. A survey of the game and fur-bearing animals of Oklahoma, State Game and Fish Commission (Oklahoma City 5), Pittman-Robertson Series 2, 144 pp., 67 photos, 16 charts, 15 maps, 33 tables, 1945.

The climatic, physical, land-use, and game characteristics of the principal ecological associations of the State are set forth. Chapters, discussing such topics as history in the State, distribution, populations, occurrence in the ecological associations, limiting factors, and management, are devoted to the more important species (or groups of species) as the bobwhite, prairie grouse, scaled quail, mourning dove, wild turkey, ring-necked pheasant, woodcock, white-tailed deer, squirrels, rabbits, and fur-bearers. There are sections also on miscellaneous game birds and mammals. Bibliography of 46 titles. A well-organized compendium of a great deal of information.

Management: Inventory, herd and range

Hunter, Gilbert N. Methods of determining trends in big game numbers and range conditions, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 234-241.

Knowing actual population is not so important to the wildlife manager as understanding trend of numbers. A method of determining this developed in Colorado is described (involving sample plots surveyed either from the air or on the ground; utilization plots and the nomenclature employed, and maps) and summarized as follows: "(1) Numbers of big game present are not as important as the relationship the numbers bear to range condition and big game carrying capacity; (2) population trends, both aerial and ground, have proved satisfac-

in the Province, varying from about 10 to 500 square miles in extent. Large areas allow for a portion to be trapped one year while another rests. Traplines usually follow streams or lakes with watersheds as outer boundaries. There is a one-mile reserve between boundaries of adjacent lines. Every trapper submits a return form. There is no prescribed limit to the take, but overtrapping may result in cancellation of the permit. Overtrapping is indicated by fluctuations in annual takes, and confirmed through investigation of the area by a warden. Poaching of beaver has occurred, but can be reduced considerably through a recent regulation requiring that all beaver pelts be officially marked or tagged before they can be sold. Annual returns indicate a marked increase in populations of fox, mink and muskrat, during the last 4 to 6 years, over that for a similar period at the start of the system in 1926. Annual average income for trappers in upper brackets ranges from $2,000 to $5,000 for 6 months of work, with $1,000 as a possible average for all. As much as $10,000 has been made in one year by a single trapper without detriment to the breeding population. Lines can be leased, loaned, or sold, but authority must be granted by the Game Commission. The system appears to be universally favored. Registered trappers have, to a certain degree, become fur farmers, and the majority desire to protect and build up their fur populations, and to crop off only the surplus."

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tory and practical; (3) population trend plot system uses a minimum amount of man power; (4) population trends should be taken at least once a month during winter grazing season; (5) 'key species' system of range appraisal is preferred over other systems as average fieldman readily understands its application; (6) population trend plot system can be used on big game, game birds, fish, and fur bearers; (7) population trend plot system, if carried over a period of years, will give a good index of herd variation in relation to range and become an important tool of sound game management."

Management: Muskrat

Errington, Paul L. Fur refuge experiments pay out, Iowa Conservationist (Iowa State Conservation Commission, Des Moines), 4(10), Oct. 1945, pp. 175-176, 2 photos.

Comment on refuges for waterfowl and conclusion that "comparatively small refuges seem best for conserving breeding stocks of the less mobile creatures." When fur prices are high, muskrats are likely to be trapped too closely but "good management should insure that fair numbers regularly escape trappers and natural hazards to winter and breed." "A spring breeding stock amounting to a fifth of the fall population will ordinarily allow the recovery needed for sustained, high-yield trapping." Muskrat production tends to be stable despite drought, cyclic fluctuation, and disease. Desirable features of refuges are pointed out; trial on a small scale in Iowa has proved satisfactory.

Management: Muskrat

Gilfillan, Merrill C. More muskrats on the farm, Ohio Conservation Bul. (1106 State Office Bldg., Columbus 15, Ohio. 10 cents a copy), 10(1), Jan. 1946, pp. 12-13, 29, 8 figs.

There are many opportunities for producing muskrats that are not being utilized. Suggestions are made for stream, ditch, marsh, and pond management, maintenance of food supply, protection from enemies, and harvesting and marketing the fur crop.

Management: National park wildlife

Ratcliff, Harold M., and Lowell Sumner. National Park wildlife ranges, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 246-250.

A good proportion of the western national parks are in mountainous country that provides summer but not winter range for migratory big game. On some of these areas, moreover, the animals are hemmed in and become concentrated on reduced areas which soon are overforaged. Reduction in numbers is in most cases the only practicable remedy. Sometimes hunting outside the boundaries drives the animals back into the parks where they must be disposed of by employes. The National Park Service now has ample authority for herd reduction and in exercising it has either approached, or fully obtained, the desired results in certain cases. Prevention of damage to the range by saddle and pack

horses is largely accomplished by feeding, and by livestock through gradual elimination of grazing permits. Examples are given of damage to, and destruction of, native animals by the competition of livestock.

Management: Overpopulation, elk

Scheffer, Paul M., and Richard M. Bond. A problem of antler room, Soil Conservation (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 11(7), Jan. 1946, pp. 161-166, 8 photos + cover cut.

Introduced in 1913, elk increased on the eastern slopes of the Cascade Mountains until agricultural damage began to be noticed in the Wenas Valley in 1925. Protection of haystacks was necessary in 1938 and 1943. The animals also consume or destroy about a third of the perennial forage of the area. The mountain range is described; there overgrazing has induced serious soil erosion over considerable areas. Competition has made it necessary to reduce the head of livestock on the summer range; nevertheless, deterioration continues. Special hunting seasons removed 2,000 elk and strong fences were built around haystacks by the Washington State Game Commission. Still there are too many elk in the Wenas Valley and it is suggested that their number be reduced and held to about 150. The entire herd also should be cut down in proportion.

Management: Pheasant

Authors. The ring-necked pheasant and its management in North America. American Wildlife Institute (Investment Bldg., Washington 5, D. C. $3.50 a copy), xi+320 pp., 32 pls. (2 col.), 12 figs., 19 tables, 1945.

This book by 17 authors, mostly members of the Fish and Wildlife Service at the time they performed the basic field work and wrote their respective chapters, was edited (but not seen through the press) by W. L. McAtee. The chapters include a historical introduction by Frederic C. Walcott, an account of the classification and distribution of the game, or true, pheasants by Jean Delacour, a section on pheasant propagation by Woodrow W. Bailey and Ralph B. Nestler, and reports on regional studies as follows: Pennsylvania and New Jersey (Logan J. Bennett), Northeast (John Pearce), Ohio (Daniel L. Leedy and Lawrence E. Hicks), Michigan (Howard M. Wight, Paul D. Dalke, and P. F. English), Northern Prairie States (Paul L. Errington), Sandhill Region of Nebraska (Ward M. Sharp and H. Elliott McClure), Intermountain Irrigated Region (D. Irvin Rasmussen and William T. McKean), and the Pacific Northwest (Arthur S. Einarsen). These regional accounts deal with life history, habitat requirements, limiting factors, and management, and together constitute the greatest body of original information that has ever been published on the habits and handling of the common pheasant. The work is, moreover, amply illustrated and well made. There is a 7-page list of literature cited.

Management: Pheasant

Einarsen, Arthur S. Some factors affecting ring-necked pheasant population density, Murrelet (Washington State Museum, University of Washington, Seattle 5. 70 cents a copy), 26(3), Sept.-Dec. 1945, pp. 39-44, 2 tables. (A Cooperative Wildlife Research contribution.)

Report on a period subsequent to that dealt with in a paper with the same title abstracted in WILDLIFE REVIEW, No. 43, June 1945, p. 47. Various factors, including military occupancy of the study area, resulted in catastrophic decrease in the pheasant population. The effect of these limiting influences is discussed and the conclusion drawn that without public cooperation game management will rest on a shaky foundation. The entire study is summarized in 12 numbered paragraphs.

Management: Pond

Davis, Cecil. What can 10,000 new ponds mean to Missouri wildlife?, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 7(1), Jan. 1946, pp. 2-3, 15, 3 figs.

That many new ponds were made in the State in 1945. Properly managed these may be a great asset to wildlife. The possibilities and steps necessary to realizing them are set forth. The cost of pond development is negligible compared to the returns measured in dollars or in recreation and happier living.

Management: Pond

Tulenko, Paul Q. Developing your pond area for wildlife, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 6(3), March 1945, pp. 12-13.

Experiments by the author and accumulated experience of Commission field personnel in planting pond watersheds have permitted the development of a diagrammatic pond-planting plan. Plants are selected mainly for their value to wildlife and erosion control. Group plantings of several . . . of each species used are recommended. Evergreens have proved best to furnish winter cover for wildlife and act as windbreaks; fruit-producing shrubs are selected to provide food. . . . suitable plants in kinds and numbers [for] . . . a half-acre watershed are combined in a wildlife bundle and furnished with a planting plan to farmers at cost by the Conservation Commission. Search for new suitable species continues and these are added to the list as they are proved available.--W. O. Nagel in Biological Abstracts.

Management: Public game lands

Bromley, A. W. Evaluation of the New York State Experimental Cooperative Landowner-Sportsman controlled public hunting grounds program, 1939-1943, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 9-29, 4 figs., 2 tables.

The essentials of the plan are outlined and its working during 5 years on 122,000 acres of land leased from 1,204 owners is summarized. Costs and game productivity are analyzed. The areas are of value as proving grounds for management techniques. Efforts to encourage pheasant-rearing by individuals met with isolated successes but with general disappointment. The program seems to offer a solution to the problem of providing hunting for metropolitan shooters. Improvement of public relations of the Conservation Department was considerable. Cost to the State exceeded the income from license fees of the hunters accommodated but the experience gained will be valuable in the approach to any future public hunting program.

Management: Public game lands

Gordon, Seth. Progress of the public game lands program in Pennsylvania, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C., $1.00 a copy), pp. 1-8.

The first primary game refuge was established in 1905; in 1915 the Legislature authorized the Game Commission to lease (and in 1919 to buy) lands for refuges and public hunting grounds. On December 31, 1944, Pennsylvania had some 778,000 acres of State game lands with approximately 38,000 acres additional under contract for purchase, including 207 primary refuges totaling 59,371 acres, leaving more than 740,000 acres open to public hunting. Beyond these were 83 primary refuges on State and national forests. They comprise nearly 57,000 acres and practically all of the remainder of these reservations, more than 2 million acres, is open to public hunting. On privately-owned lands are 51 auxiliary refuge projects, of which the sanctuary portions embrace 11,379 acres, leaving 33,035 acres for public hunting. Under a cooperative farm-game program, the organization of which is outlined, there were in 1944 a total of 72 projects in operation, totaling 153,208 acres. Of these, 5,738 are used for refuges, 36,076 for safety zones, 41,814 are closed, and 111,394 are open to hunting. The harvest of 1943 on these areas amounted to 78,523 head of game. "As of January 1, 1945, the Pennsylvania Game Commission had under its control for wildlife purposes a total of 1,063,708 acres, of which 199,910 acres were closed and 863,798 acres were open to public hunting." In the future, emphasis will be placed upon management of these areas and improvement of the farm-game program rather than on further acquisition of land.

Management: Quail, Valley

Glading, Ben, David M. Selleck, and Fred T. Ross. Valley quail under private management at the Dune Lakes Club, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 31(4), Oct. 1945, pp. 166-183, Figs., 51-54, 7 tables.

Description and history of the area; account of management measures, including stocking, feeding, predator control, cover and food planting, and watering. Records of the take, and estimates of crippling losses and cost of management are presented. Field studies were made of the quail population, old-young ratio, fate of nests, predators (66 stomach analyses of birds and 40 of mammals summarized), food habits, and stocking results. Authors' summary:

"An extremely high valley quail population (up to 4.8 birds per acre in late autumn) was built up by private individuals at the Dune Lakes Club by habitat management. In the years 1939 to 1941, the bag averaged more than one quail per habitable acre during the annual hunt. The chief management methods employed were artificial feeding and predator control. Planting of feed and cover, management of grazing, introduction of new birds, and supplying additional water were also practiced. Studies were conducted on the methods employed and observations made of the habits of predators. Under conditions that existed at the club, the intensive local predator control practiced was probably largely responsible for the high quail population. Feeding of quail was necessary to maintain the high population."

Management: Range

Presnall, Clifford C. All flesh is grass, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 224-228.

The great livestock losses during the dry summers and hard winters of 1885-87 were due as much to abuse of the range as to severity of the weather. There was no insurance in the form of reserve grass. Individual ranchers, the Forest Service, and later the Grazing Service, have concentrated on producing more grass than the stock of animals could use and have been rewarded by greatly increased production. Taxation and bank administration should be based on forage capacity rather than on number of animals. Sportsmen should cooperate with ranchers in consenting to removal of game where it is damaging the range and in refraining from demanding game stocking in already overutilized environment. All parties at interest should get together, try to understand each other's problems, and cooperate in achieving the fundamental objective which is maintenance of maximum forage supply.

Management: Range

Schwan, H. E. Big game and livestock on the western range, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 219-224.

Simple competition between big game and livestock does not explain range conditions that are now of the greatest concern in the West. Overgrazing by cattle has led to the encroachment of brush and weeds upon millions of acres of grassland and together with fire control has brought about the extension of forest growth over great areas of formerly valuable range. Sheep-grazing, on the other hand, results in the conversion of some forage types to grassland. "The effect of game animal use on the range seems generally to have been more like the effect of sheep grazing." Data in support of this conclusion are cited. Changes in the western range have come about as a result of more or less haphazard usage and perhaps too little is now known to improve matters by planned utilization. The need for greatly accelerated and expanded research is more than evident. Range resources, livestock and game demands upon them, and ecology as a practical rather than a theoretical discipline, are in great need of elucidation. All of this must be done with man and his domesticated

animals present and continually modifying the environment. However, the "objective must include complete protection or improvement of the soil and water resources of the land since no range use, either by livestock or game, can endure if these are damaged." When in possession of good store of basic knowledge, it should be possible to apply much more intelligently such treatments as burning, seeding, rodent control, grazing with particular kinds of animals, or rotating the use between various kinds of animals, and other practices. The result ought to be maximum public benefit by converting range forage into the kinds of animals which can best use the range and which can contribute most to public needs and welfare." Bibliography of 12 titles.

Management: Range

Stoddart, L. A., and D. I. Rasmussen. Big game--range livestock competition on western ranges, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 251-256, 3 tables.

Within recent years, all big game, except mountain sheep, has increased in western states causing both stockmen and sportsmen to become alarmed over range competition between these animals and livestock. In this mostly dry country, forage production is limited and "even under best management, some western ranges look bad, and may appear to be misused." The authors discuss difficulties in management of the range and point out that "the least productive unit . . . limits the capacity of the whole." Overuse, either by game or stock, reduces production and carrying capacity, the problem being worse with the wild animals, which usually can not be moved, and which as a rule are hurt rather than helped by winter feeding. The real problem is maintenance of adequate winter range and herds should be kept well within carrying capacity. Maximum productivity can be obtained from a variety of animals on the same range. Inspection will show which animal is overusing an area and that species should be reduced--a process to be continued until forage balance and stability of the range are assured. "In summary, good game and good livestock result from good land management, and every sportsman and stockman should strive for a better comprehension of what a good range consists of and how that range must be managed and protected if the game herds and livestock herds are to continue to thrive. Even on areas where no livestock graze, still game numbers must be limited and the herds managed on the basis of the range forage supply."

Management: Refuge

Salyer, J. Clark, II. The permanent value of refuges in waterfowl management, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 43-47.

The most successful programs for wildlife conservation have been based in part upon refuges. The primary objectives of the Federal migratory bird refuge system--restoration of breeding grounds and provision of havens along the migration routes--were sound, and to a large degree have been achieved. The refuges contribute much to the preservation of the breeding stock necessary to keep the waterfowl population going. They are of value to other wildlife

and have contributed substantially to the growing of war food crops and the grazing of livestock. They also function as field laboratories in wildlife management.

Management: Reservoir

Wiebe, A. H. Improving conditions for migratory waterfowl on TVA impoundments, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 4-8.

The number of birds wintering is far below the expectations of hunters and conservationists. The principal detrimental factor is the annual winter drawdown for flood control; lesser fluctuations occur also at other seasons. Their effect upon the waterfowl is through reduction in quantity and availability of food plants. Submerged aquatics are inevitably scarce as the depth of the drawdown is greater than that of the light penetration essential to growth of the plants. The availability of emergent, mud-flat, and shore plants is so affected by the fluctuations in water level that their full value is far from realized. The author suggests that the situation may be improved by growing crop plants for the birds, draining areas productive of food that can be flooded later to make the feed available, and maintaining certain isolated pools at constant levels. Bibliography of 6 titles.

Management: Soil conservation in relation to wildlife

Anderson, Wallace L. Biology handbook. U. S. Dept. of Agriculture, Soil Conservation Service, Upper Mississippi Region (4650 North Port Washington Road, Milwaukee 12, Wisc.), 2nd edition, 83 pp., figs., tables (processed), 1945.

This "handbook has been prepared to provide Soil Conservation Service employees, in a single volume, with the biological principles, recommendations and suggestions necessary to apply biological knowledge to the solution of land-use problems and the application of soil and water conservation practices. It is also intended to contribute to the prevention and control of biological damage resulting from the establishment of soil and water conservation practices." Chapter headings, indicating the contents, are: Biologic relationships of land, plants, and animals; importance of wildlife to agriculture; essential requirements of wildlife; soil and water conservation practices that benefit wildlife; and establishment of conservation practices. A carefully prepared and useful manual, part of the credit for which, as acknowledged, is due to Warren W. Chase, Charles A. Dambach, and L. M. Dickerson.

Management: Stocking wild turkey

Newman, Coleman C. Turkey restocking efforts in East Texas, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 279-289, 1 fig., 2 tables.

Characteristics and limits (mapped) of the range of the eastern wild turkey; decimation of the original population, last records for numerous local-

ities; efforts at restoration, using birds of both the eastern and Rio Grande subspecies. Pen-propagation and management of the eastern turkey are described. As a result of the experience, restocking with wild-trapped birds is recommended.

Management: Strip-mined areas

Bach, Roy N. The Federal Aid Division makes good use of airplane on lignite spoil areas, North Dakota Outdoors (State Game and Fish Dept., Bismarck, N. Dak. 5 cents a copy), 8(4), Oct. 1945, pp. 3-5, 3 figs.

Description of plane, hopper, and methods used in sowing clover seed on these areas, which can be so greatly improved by planting. About 75 percent of the clover grew and the experiment is deemed successful.

Management: Waterfowl

Gabrielson, Ira N. Basic concepts of waterfowl management, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 30-34.

Some species as the mallard, pintail, and widgeon, are approaching the maximum numbers that can be maintained under present conditions. While others still need to be increased, the program for the future will involve less restoration than in the past decade and more management. Regulating seasons in accordance with the status of the birds meets difficulties in the desires of local groups of sportsmen. Increase in the numbers of certain species has resulted in damage to crops that must be controlled to prevent unfavorable reaction toward conservation policies. Postwar increase in hunting is likely so that it would be a mistake to liberalize hunting privileges in advance. Proposed changes in regulations are discussed in their relation to the general problem, and the zone and flyway concepts of management are compared.

Management: Waterfowl

Siegler, Hilbert R. Waterfowl and their management in inland Texas, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 274-280, 1 map, 1 table.

Characteristics of the study area (northeastern Texas) in relation to waterfowl; occurrence, movements, and food habits of the birds. Hunting customs, success, and cost ($3.71 per duck). Suggested steps to improve hunting conditions. "To hold more ducks in eastern Texas the following items of management, placed in the order of their importance are recommended: more and larger lakes, more refuges, more cover on lakes, and more food." "The control of obnoxious weeds, particularly in the various swamps and marshes, can at times be a helpful management device. A major cause for unsatisfactory hunting in eastern Texas lies with the average hunter himself; his misguided concept of sportsmanship based on 'bag limits'; his lack of ability in the art of calling ducks; his ignorance of the possibilities in the river bottoms; and

his habit of doing most of his hunting at the beginning of the season rather than later when most mallards have arrived."

Management: Winter feeding

Nagel, W. O. This matter of winter feeding, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 7(1), Jan. 1946, pp. 1, 14-15, 2 figs.

The advantages and disadvantages are discussed and the conclusion drawn that "the best and most helpful thing that can be done . . . is to provide each species with the natural food and cover it needs." "Emergency feeding to help game live through bad weather and winter-long feeding to attract songbirds" are recognized as desirable activities and suggestions are made as to carrying them on.

Natural History: Birds of Minnesota

Breckenridge, W. J. Bird hawks, eagles, and vultures, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 9(50), Jan.-Feb. 1946, pp. 16-22, 2 figs.

Brief account of occurrence in Minnesota, habits, and economic value of the birds specified in the title.

Natural History: Birds of Rocky Mountain National Park, Colorado

Packard, Fred M. The birds of Rocky Mountain National Park, Colorado, Auk (F. C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D.C. $1.00 a copy), 62(3), July 1945, pp. 371-394.

215 species of birds have been recorded in the National Park, 28 of them added in this checklist. Migrational and nesting data, the elevations of occurrence, and behavior patterns are discussed under each species and comparison with adjacent regions made. Bibliography of 30 titles.--F. M. Packard.

Natural History: Black Hills

Coats, G. W. Some observations on wildlife in the Black Hills during the past sixty-five years, South Dakota Conservation Digest (South Dakota Dept. of Game, Fish, and Parks, Pierre), Nov. 1945, pp. 10-11, 15.

Interesting recollections of a considerable variety of wildlife.

Natural History: Cats of Texas

Davis, Wm. B. Texas cats, Texas Game and Fish (Walton Bldg., Austin, Texas. 10 cents a copy), 3(12), Nov. 1945, pp. 21-23, 29, 5 figs.

Notes on the appearance, occurrence, habits, and economic status of the jaguar, ocelot, mountain lion, margay, jaguarundi, and bobcat.

Natural History: Distribution of birds

Authors. Bird distribution and ecological concepts, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 57(4), Dec. 1945, pp. 243-252, 1 map, 2 tables.

"Birds of a deciduous forest aquatic succession," by John W. Aldrich, proposes reconciliation of the life zone and biome concepts and presents tables showing the succession of birds from water to the forest climax and the annual fluctuations in bird populations in swamps of northeastern Ohio, 1932-1939.

"Birds of the deciduous forest," by Joseph J. Hickey, briefly reviews certain literature (7 titles cited) on bird association and succession in such forests, both European and American.

"Grassland birds," by C. A. Stevens, notes that while the central grassland extends from Mexico to Canada, there is some evidence of distribution of races or strains of birds and plants corresponding to life zones.

"Coniferous forest birds," by Roger T. Peterson, notes the generally and locally distributed birds of this forest and states that "the biome is not much more satisfactory than the life zone in describing bird distribution."

"The relative merits of the life zone and biome concepts," by V. E. Shelford, presents a map of North American biomes with life zone boundaries superimposed, discusses the advantages and disadvantages of the two systems from several points of view, and favors the biome concept.

[These abstracts should have been assigned to the section of ecology, but having placed that of a previously published paper in the same symposium under Natural History, the precedent was allowed to rule.]

Natural History: Hawks of Minnesota

Breckenridge, W. J. The broad-winged or soaring hawks, Conservation Volunteer (State Dept. of Conservation, St. Paul, Minn.), 8(49), Nov.-Dec. 1945, pp. 6-12, 2 figs., 1 table.

Flight characteristics of hawks; account of habits and economic value of 6 species of buteonine hawks occurring in Minnesota.

Natural History: Kangaroo rats of Utah

Durrant, Stephen D., and Henry W. Setzer. The distribution and taxonomy of kangaroo rats (Genus Dipodomys) of Utah, Bul. Univ. Utah (Salt Lake City), 35(26), June 1945, 59 pp., 2 figs., 4 maps.

Key to 4 species and systematic treatment of 23 subspecies in which the original description is cited, the type specified, the range in Utah (and in general) stated, and a diagnosis, remarks, and records of occurrence in Utah presented.

Natural History: Snakes

Conant, Roger. Snakes, School Nature League Bulletin (National Audubon Society, 1006 Fifth Ave., New York 28, N. Y. 10 cents a copy), 16(5), Jan. 1946, 4 pp., 6 photos.

Condensed popular review of facts about snakes under the headings of: feeding habits, reproduction, shedding, locomotion, use of the tongue, and poisonous snakes, including treatment of snakebite. Author's conclusion: "Numerous calculations have been made that prove conclusively that snakes, in general, are useful animals and that they make a marked contribution to our national economy by the prodigious quantities of destructive rodents they consume every year. Like the rodent eating hawks and owls they occasionally eat birds--even chicks--but the little damage they do is far outweighed by the immense good they accomplish. Farmers have learned that snakes are good things to encourage. Since the serpents hold an important place in the balance of nature it is well to let them alone. Let all kinds go their way in peace. Don't kill a snake just because it is a snake. If it is dangerous, you should avoid it so you won't be bitten. And if it is harmless, the chances are that it is a useful kind that is of real value."

Predation

Abbott, Jacob Bates. This predator legend, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 16(8), Nov. 1945, pp. 4-5, 18, 24, 6 figs.

Man, greatest of predators, makes much complaint of comparatively minor figures in this field, An ironical account of man in relation to predators and their prey, with special reference to foxes, weasels, hawks and owls, and snakes. "Probably in the great structure of Nature's total scheme, each beastie, no matter how noxious to us, had its sphere of beneficial influence. We have disturbed conditions that untold centuries were spent in creating, and history has proven that we do not excel as 'controllers' of resources or wildlife."

Predation: On waterfowl nests

Sooter, Clarence A. Habits of coyotes in destroying nests and eggs of waterfowl, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 33-38, 2 pls., 1 table.

A tabulation records known destruction (about 10 percent) of duck, goose, and crane nests by predators on the Malheur National Wildlife Refuge, Oregon, 1938-43. Predation by ravens exceeded that by coyotes. This paper is devoted

to description and illustration of the evidences of predation, largely of the coyote. Author's summary: "Destruction of waterfowl nests and eggs by coyotes on the Malheur National Wildlife Refuge varies as to pattern. At times it is difficult to distinguish damage by coyotes to eggs from that done by birds. At times coyotes bury eggs taken from nests they have located."

Propagation: Feeding bobwhites

Nestler, R. B., L. M. Llewellyn, and M. J. Rensberger. Comparison of animal and plant proteins for young pen-reared bobwhite quail, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 274-279.

Report on experiments to determine the value of protein supplements. Among animal foods, sardine and menhaden meals were satisfactory and meat and bone scraps and dried buttermilk of lower value. Of vegetable proteins, those from soybean or peanut oil meal were better than cottonseed oil meal. However, these items combined with dried buttermilk gave good results. Bibliography of 6 titles.

Propagation: Hare, Snowshoe

Severaid, Joyce Harold. Breeding potential and artificial propagation of the snowshoe hare, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, pp. 290-295, 2 tables.

Author's summary: "(1) The breeding potential for the snowshoe hare in captivity is 8.7 young per female per season, based upon the following data: (a) gestation period of 37 days; (b) rebreeding on day of parturition; (c) average litter of 2.9 young; (d) average of 3.0 litters per season per female; (2) survival of pen-raised hares was 84 per cent during the last two breeding periods of 1941 by reducing the occurrence of coccidiosis through specially constructed rearing units; (3) the rearing of leverets by foster mothers proved successful; (4) even under close confinement there is reasonable tolerance in this species between sexes and between individuals of the same sex; (5) females should not be mated with males prior to March 20 if a grouping of litters and a knowledge of their probable birth dates are desired; (6) the type of pen which proved most successful closely resembled that used by commercial rabbitries; (7) the production cost--to age of liberation--is estimated to be from $1.25 to $1.50 per hare."

Research: Banding

Wandell, Willet N. Rapid method for opening and arranging pheasant bands, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 9(4), Oct. 1945, p. 325, 1 pl.

Description and illustration of a home-made device for the purpose.

Research: Environmental analysis

Barick, Frank B. Environmental analysis of forest edges in relation to wildlife, Trans. Tenth N. A. Wildlife Conference 1945 (American Wildlife Institute, Investment Bldg., Washington 5, D. C. $1.00 a copy), pp. 126-136, 4 figs., 3 tables.

Partial report on a study of edge effect in certain Adirondack forest types. "Edge" is used to cover zones of transition between associations within the forest. The investigation was by an interrupted transect method, the results of which were subject to convenient graphing and statistical analysis. Sample findings are presented and discussed. "On the basis of specific information gained from detailed investigations, it is possible to build a management plan which will not waste time improving habitats which do not need improving, or worse yet, improving habitats by the addition of features which are already present. By means of critical and detailed analysis it is possible to find more rapidly and more exactly those limiting factors which are most detrimental to the wildlife populations being managed, and thus point the way for more efficient control of forest wildlife habitats."

Research: Food analysis

Martin, A. C., R. H. Gensch, and C. P. Brown. Alternative methods in upland gamebird food analysis, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 8-12, 1 table.

Comparison of aggregate-percentage and aggregate-volume methods. They give more similar results with large, than with small, series of specimens. The aggregate-volume method is considered superior in ease and speed of operation; it is, however, applicable only to crop contents. Authors should clearly indicate the methods they use.

Research: Live trapping cotton rat

Scott, J. Allen. A box trap for cotton rats, Science (Science Press, Lancaster, Pa. 15 cents a copy), 102(2657), Nov. 30, 1945, p. 567, 1 fig.

Illustration and description of a modified box trap that has been successfully used in Texas.

Research: Live trapping Norway rat

Richter, Curt P., and John T. Emlen, Jr. A modified rabbit box trap for use in catching live wild rats for laboratory and field studies. U. S. Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 60(44), Nov. 2, 1945, pp. 1303-1308, 3 figs.

Description and illustrations of a simple and inexpensive trap that has been used with great success in Baltimore. A collecting box and a small metal trap used for transferring live rats also are described.

Research: Live-trapping snowshoe hare

Aldous, C. M. Box trap for snowshoe hares and small rodents, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 71-72, 1 fig.

Description and illustrations of a trap devised by the author and explanation of its advantages and use.

Research: Live trapping and tagging muskrats

Aldous, Shaler E. Live trapping and tagging muskrats, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan., 1946, pp. 42-44, 1 pl.

Review of methods recorded by previous writers and description of the ear tag and live traps used by the author. A cone-like holder for handling the animals also is described and figured. Method of using this equipment is recounted.

Research: Restraining tube

Thomas, Lyell J. Efficient handler for small mammals, Science (Science Press, Lancaster, Pa. 15 cents a copy), 101(2628), May 11, 1945, p. 496, 1 fig.

Description and illustration of a wire-mesh cone, stopper, and plunger that has proved satisfactory in handling rats, with directions for its use.

Weights

Hartman, Frank A. Adrenal and thyroid weights of birds, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 63(1), Jan. 1946, pp. 42-64, 1 table.

Includes also body weights of a considerable number of species.

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U. S. Department of the Interior, Chicago 54, Ill.

272. Birds in relation to fishes, by Clarence Cottam and F. M. Uhler, 16 pp., August 1945.

Replacing Wildlife Research and Management Leaflet BS-83 (1937), this circular deals with causes of fish depletion, birds in their economic relation to fishes, ecological limitations on fish abundance, food of 13 species or groups of species of fish-eating birds, and various means of controlling or preventing bird depredations on fishes.

279. Abstract of fur laws, 1945-46, compiled by Frank G. Ashbrook, 48 pp., October 1945.

The relation of the Federal Lacey Act and amendments to fur animals and fur trade is set forth and the laws and regulations in the same field for the states, Territory of Alaska, and Canadian provinces are summarized.

NOTES AND NEWS

The Committee on Professional Standards of The Wildlife Society (George O. Hendrickson, Chairman) published in The Journal of Wildlife Management (9(4), Oct. 1945, pp. 323-324) a report on "Knowledge, abilities, and techniques needed by a wildlife manager." Its subdivisions are headed: Recognition of wildlife forms, ecological knowledge, special techniques, administration, and public relations.

Two articles in the January-February issue of Conservation Volunteer (9(50), Minnesota Dept. of Conservation, State Office Bldg., St. Paul) are addressed to present and prospective wildlife managers. They are: "Jobs in the wildlife field," by Gustav Swanson, pp. 29-33, and "Training wildlife managers," by William H. Marshall, pp. 34-35.

"Rodent mail, rats and mice," a periodical issued by the Infestation Division, British Ministry of Food, contains control news from the Empire, and special articles on mammals, particularly on rat economics and control. It is distributed by the British Commonwealth Scientific Office, 1910 K Street, N.W., Washington 6, D. C.

The game farm of J. Stokley Ligon, Carlsbad, New Mexico, has been sold to the State Game and Fish Commission and will be operated by that organization in furtherance of plans for introduction and restocking of game birds in the commonwealth.

AUTHOR INDEX FOR THIS ISSUE

	Page
Abbott, Jacob Bates	45
Aldous, C. M.	23, 48
Aldous, Shaler E.	48
Aldrich, John W.	44
Allen, Durward L.	16
Allen, Ralph H., Jr.	20
Anderson, Rudolph M.	2
Anderson, Wallace L.	41
Ashbrook, Frank G.	49
Bach, Roy N.	42
Bailey, Woodrow	36
Barick, Frank B.	47
Baumgartner, F. M.	22, 26
Beamer, P. D.	9
Beaudette, F. R.	7
Bellrose, Frank C., Jr.	9
Bennett, Logan J.	36
Black, C. T.	5
Bond, Richard M.	16, 36
Breckenridge, W. J.	43, 44
Bromley, A. W.	37
Brooks, Allan	23
Brown, Charles P.	21, 47
Brown, Louis G.	26
Carson, Burch, Jr.	2
Chitty, Dennis	6
Chitty, Helen	6
Coats, G. W.	43
Cook, David B.	16, 20, 22
Cook, Fannye A.	32, 33
Conant, Roger	45
Cottam, Clarence	21, 48
Cowles, R. B.	22
Cozort, C. E.	26
Crawford, Bill T.	15
Dalke, Paul D.	36
Dambach, Charles A.	13
Dana, Samuel T.	3
Darrow, Robert W.	19
Davis, Cecil	37
Davis, Wm. B.	43
Debus, Jeanette S.	11
Delacour, Jean	36
Denton, J. Fred	8
Dougherty, Ellsworth C.	10
Duck, L. G.	34
Durrant, Stephen D.	44
Einarsen, Arthur S.	27, 36, 37
Eklund, Carl R.	32
Elliott, Charles	17
Emlen, John T., Jr.	47
English, P. F.	29, 36
Erickson, Arnold B.	10
Errington, Paul L.	2, 35, 36
Fearnow, Theodore C.	30
Fletcher, Jack B.	34
Foote, Leonard E.	24, 28
Fox, Charles K.	29
Gabrielson, Ira N.	17, 42
Garlough, F. E.	3
Gensch, R. H.	47
Gilfillan, Merrill C.	35
Giltner, L. T.	7
Glading, Ben	38
Gloyd, H. K.	4
Goble, Frans C.	10
Gordon, Seth	30, 38
Gowanloch, James Nelson	5
Grant, Chapman	18
Hahn, Henry C., Jr.	15
Hamilton, William J., Jr.	16
Hampton, Brock C.	7
Handley, C. O.	17
Hanson, Harold C.	9
Hardy, Ross	12
Hare, John E.	9
Harris, Dave	19
Hartman, Frank A.	48
Headstrom, Richard	3
Hendrickson, George O.	49
Herbert, Paul A.	31
Herman, Carlton M.	6, 9, 11
Hickey, Joseph J.	44
Hicks, Lawrence E.	36
Hinshaw, W. R.	12
Hudson, C. B.	7
Hunter, Gilbert M.	34
Imler, Ralph H.	4
Ingles, Lloyd G.	21
Jellison, William L.	8, 11
Junod, Fred L.	12
Kimball, J. W.	6
Koepke, Jean A.	8
Krauch, Hermann	3

	Page
Kutz, H. L.	10
Lagler, Karl F.	23
Lay, Daniel W.	33
Leedy, Daniel L.	36
Leopold, Aldo	15, 29
Linsdale, Jean M.	2
Llewellyn, L. M.	46
Longstreet, R. J.	14
MacCreary, Donald	9
Manter, H. W.	11
Marshall, William H.	49
Martin, A. C.	47
McAtee, W. L.	36
McClure, H. Elliott	25, 36
McCullough, George W.	18
McKean, William T.	36
McNeil, E.	12
Michener, Harold	22
Michener, Josephine R.	22
Miller, W. L.	24
Mills, H. R.	14
Mitchell, Glen E.	25
Mohler, Levi L.	7, 25
Moore, A. D.	12
Mousley, H.	19
Munro, J. A.	2
Murphy, Robert Cushman	2
Nagel, W. O.	32, 43
Nelson, A. L.	19
Nestler, Ralph B.	36, 46
Newman, Coleman C.	41
Nigrelli, Ross F.	10
Packard, Frod M.	19, 43
Palmer, E. Laurence	18
Parker, Kenneth W.	15
Parker, R. R.	8
Pearce, John	36
Pearson, Allen M.	20
Penfound, William T.	28
Peterson, Roger T.	44
Pope, Clifford H.	26
Presnall, Clifford C.	27, 39
Pulling, Albert Van S.	6
Rasmussen, D. Irvin	36, 40
Ratcliff, Harold M.	35
Rausch, Robert L.	11
Rensberger, M. J.	46
Richter, Curt P.	47
Robeson, Stacy B.	22
Roper, Hartwell E.	30
Ross, Fred T.	38
Rumreich, A. S.	8
Salyer, J. Clark, II.	23, 40
Schantz-Hansen, T.	20
Scheffer, Paul M.	36
Schneidau, John D.	28
Schwan, H. E.	39
Schwartz, John E., II.	25
Scott, T. Allen	47
Selleck, David M.	38
Setzer, Henry W.	44
Severaid, Joye Harold	46
Shahan, M. S.	7
Sharp, Ward M.	36
Shelford, V. E.	17, 44
Siegler, Hilbert R.	42
Smith, Donald J.	24
Sooter, Clarence A.	25, 45
Steen, M. O.	34
Stevens, O. A.	44
Stoddart, L. A.	40
Stow, Richard W.	19
Sumner, Lowell	35
Swanson, Gustav	49
Taber, F. Wallace	24
Thomas, Lyell, J.	48
Throckmorton, Michael	23
Titus, Harold	31
Treat, Dorothy A.	18
Treichler, Ray	19
Tulenko, Paul Q.	37
Uhler, F. M.	48
Van Cleave, Harley J.	8
Vorhies, Charles T.	13
Walcott, Frederick C.	36
Wandell, Willet N.	46
Ward, Justus C.	4
Ward, J. W.	11
Wiebe, A. H.	41
Wight, Howard M.	36
Yeager, Lee E.	14, 26
Zon, Raphael	3

14159